CLASS 536, ORGANIC COMPOUNDS -- PART OF THE CLASS 532-570 SERIES

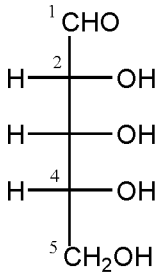
SUBCLASSES

1.11 Carbohydrates and derivatives:

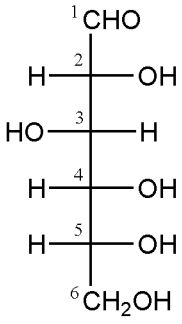
This subclass is indented under subclass 1.

Compounds which are carbohydrates or derivatives thereof, i.e., those compounds which satisfy one of the three criteria set forth below (unless otherwise indicated, figures are representative examples only):

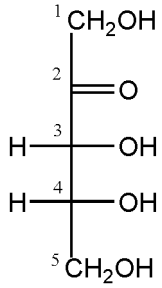
Criterion 1: compounds whose monomeric units are polyhydroxy mono-aldehydes [1, 2] or polyhydroxy mono-ketones [3, 4] having the formula $C_n(H_2O)_n$ (wherein n = 5 or 6 – subsequent references to "n" refer to these values), i.e., *"acyclic saccharides,"* of which representative samples are:



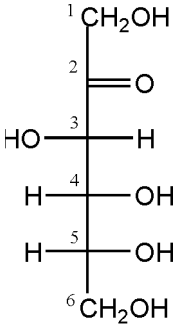
D-ribose [1]



D-glucose [2]

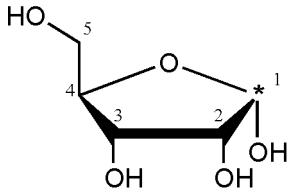


D-ribulose [3]

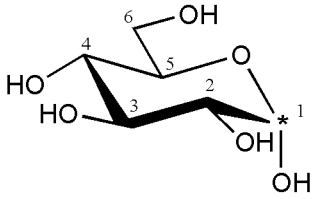


D-fructose [4]

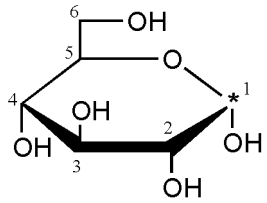
Criterion 2: the corresponding cyclic hemiacetals, i.e. *"cyclic saccharides"* of which representative examples are:



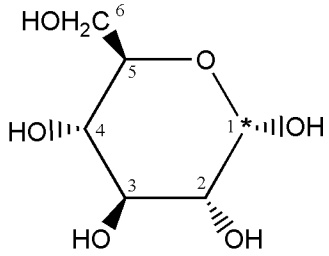
α-D-ribose D-ribofuranose [5]



α-D-glucose D-glucopyranose [6]



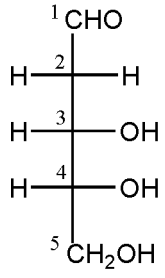
α-D-glucose D-glucopyranose [7]



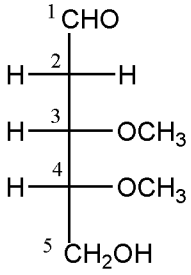
α-D-glucose D-glucopyranose [8]

wherein:
(i) figure [5] is the cyclic form of figure [1], (ii) figures [6-8] each depict, in a different way, α-D-glucose, which is one of the two cyclic forms of D-glucose shown in figure [2], (iii) figure [2] is a Fischer projection, figure [6] is a conformational projection, figure [7] is a Haworth projection, and figure [8] is a Mills projection, (iv) the number one carbon atom, the asterisked carbon atom, is the hemiacetal carbon and is also known as the anomeric carbon.

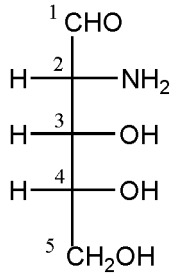
Criterion 3: the derivatives of (1) or (2) wherein:
(a) for acyclic saccharides, (i) the 5 or 6 carbon member skeleton and **the carbonyl function are not destroyed**, (ii) there are no fewer than (n - 2) total –OR moieties directly bonded to the carbon skeleton (wherein R is H or a group bonded to oxygen through carbon), (iii) no more than one oxygen atom is attached to any one carbon of the carbon skeleton, and structures [9-14] are illustrative:



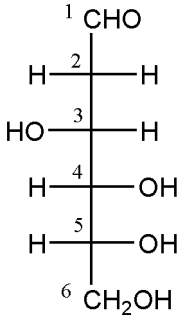
[9]



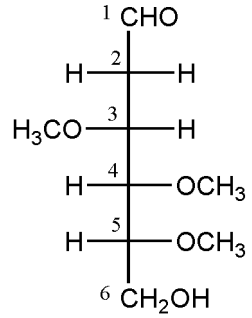
[10]



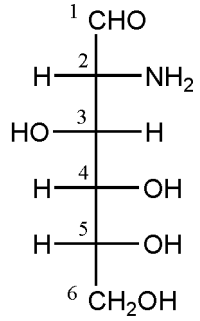
[11]



[12]



[13]

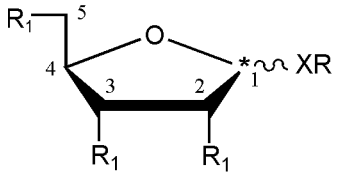


[14]

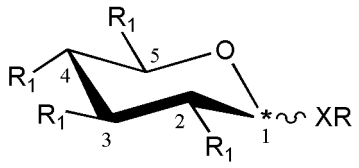
(b) for *cyclic saccharides*, except for C-glycosyl compounds described in section, and

(c) there can be substitution by moieties which do not destroy the cyclic saccharide structure as long as at least one –XH or –XR group is bonded directly to the hemiacetal/anomeric carbon (this carbon is denoted with an asterisk in the figures below), wherein X is –O–, –S–, or $–NR_S–$ and R is H or a group bonded to X through carbon and R_S is a substituent which completes the valency of the nitrogen atom,

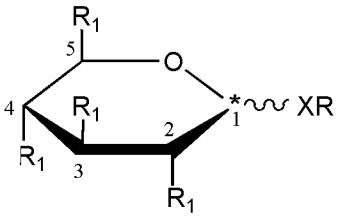
and figures [15-18] represent the minimum structure necessary to constitute a cyclic saccharide derivative:



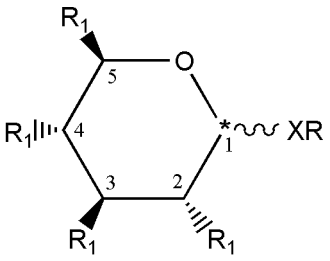
[15] n=5



[16] n=6



[17] n=6



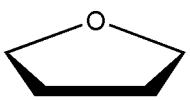
[18] n=6

wherein:

- at least one of the R_1 (where n = 5) or at least two of the R_1 (where n = 6) must be –OR wherein R is H or a group bonded to the oxygen of –OR through carbon; and the representation of the bond between XR and the ring position 1 in ech of the structures [15-18] signifies an α (i.e., axial) or β (i.e., equatorial) configuration

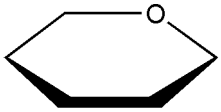
(c) for cyclic saccharide, C-glycosyl-type compounds (also known as C-glycosides)

(i) C-glycosyl compounds will have the structure defined below [19-21]



[19] n=5

[20] n=6



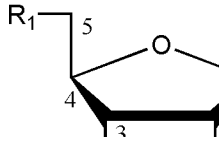
[21] n=6

wherein:
- at least one of the R_1 (where n = 5) or at least two of the R_1 (where n = 6) must be –OR wherein R is H or group bonded to the oxygen of –OR through carbon;
- R_2, R_3, and R_4 alone or in combination can be any substituent which completes the valency of the carbon atom.

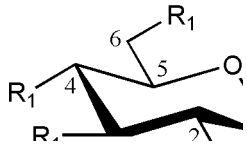
(ii) "C-glycoside", although often used in the art to represent this type compound, is a misnomer–"C-glycosyl" is the proper term.

(1) Note. All statements in this sublass definition are intended to be inclusive of all spatial and stereochemical configurations, except if otherwise specified.

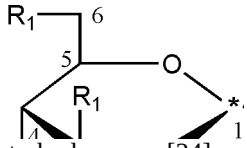
(2) Note. Oxygen heteroatom-containing cyclic compounds lacking any –XH or –XR bonded to the anomeric carbon of the cyclic structure are not carbohydrates/cyclic hemiacetals; such compounds are tetrahydrofurans [22] or tetrohydropyrans [23, 24]:



Tetrahydrofuran [22]

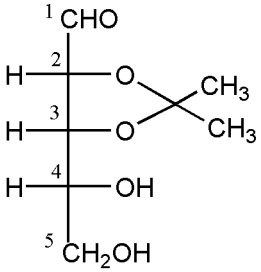


Tetrahydropyran [23]

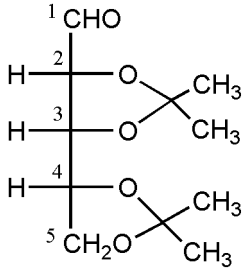


Tetrahydropyran [24]

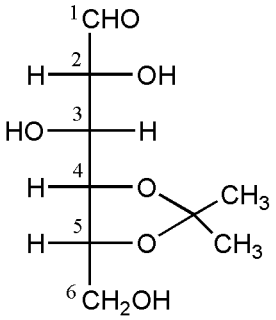
(3) Note. Included within the scope of this class are compounds wherein oxygens which are attached to carbons of the carbohydrate skeleton are also attached to the same alkylidene or substitued alkylidene groups. See, for example, structures [25-29].



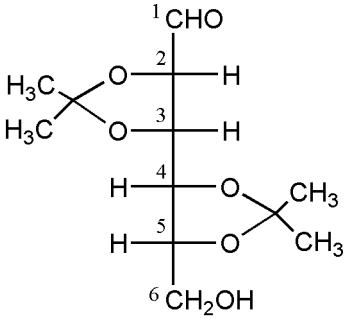
[25]



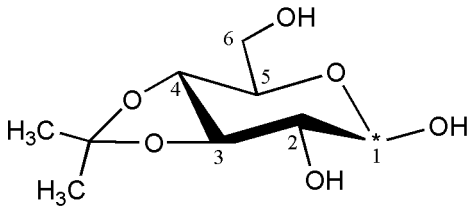
[26]



[27]



[28]



[29]

(4) Note. Carbohydrate degradation products which contain fewer than five carbon atoms in the carbohydrate moiety are not provided for in this class, but are classified elsewhere in the chemical compound area.

(5) Note. Alcohol, acid, and amine derivatives of carbohydrates which are formed by an alcohol, carboxylic acid, or amine function replacing the oxygen of the carbonyl group of an acyclic carbohydrate are not provided for in this class, but are classified elsewhere.

(6) Note. The heteroatom of the cyclic carbohydrate must be an oxygen. Compounds with different heteroatoms or compounds without a heteroatom in the cyclic structure (e.g. inositol) are not classified in this class; they are classified elsewhere.

(7) Note. Some names of common carbohydrates include:

Monosaccharides: Fructose (Fru), Fucose (Fuc), Galactosamine (GalN), Galactose (Gal), Glucosamine (GlcN), Glucose (Glc), Glucuronic acid (GlcA), Idose (Ido), Mannose (Man), Neuraminic acid (e.g., Neu5Ac, etc.), Sialic acid, Xylose (Xyl).

Oligosaccharides: Cyclodextrin, Lactose (Lac), Maltose, Raffinose, Sialyl Lewis x (sLe^x), Sucrose, Trehalose.

Homopolysaccharides (all the monomeric units are the same): Amylose/ Amylopectin, Cellulose, Chitin/Chitosan, Dextran, Glucan, Inulin, Starch.

Heteropolysaccharides (different monomers comprise the repeating unit): Algin/Alginic acid, Bacterial/capsular polysaccharides; Glycosaminoglycans (Mucopolysaccharides including Chondroitin sulfate, Dermatan sulfate, Heparin, Heparan sulfate, Hyaluronic acid, Keratan sulfate); Gums, Mannans, Pectins, Xylan.

SEE OR SEARCH THIS CLASS, SUBCLASS:

22.1 through 24.5 , for nucleic acids and oligomeric or polymeric forms thereof, including DNA or RNA fragments (e.g., genes, etc.)

SEE OR SEARCH CLASS:

127, Sugar, Starch, and Carbohydrates, subclasses 36 through 41 for hydrolysis of carbohydrates by nonbiochemical methods wherein the process stops with such hydrolysis or is followed by purification, concentration, or crystallization of the sugar or sugar solution thereby produced.

162, Paper Making and Fiber Liberation, appropriate subclasses for liberating, recovering, or purifying of cellulose fibers from natural sources.

424, Drug, Bio-Affecting and Body Treating Compositions, subclass 1.73 for carbohydrates attached to radionuclides; subclasses 9.35-9.351 for carbohydrates attached to magnetic imaging agents; and subclass 9.43 for carbohydrates attached to X-ray contrast imaging agents.

428, Stock Material or Miscellaneous Articles, subclasses 532 through 537.7 for a nonstructural laminate containing a carbohydrate.

435, Chemistry: Molecular Biology and Microbiology, subclasses 72 through 105 for enzymatic or microbial processes for synthesizing a saccharide containing compound; subclasses 274-279 for using an enzyme or microorganism to recover or purify a carbohydrate material from animal, plant, or microbial material.

514, Drug, Bio-Affecting and Body Treating Compositions, subclasses 23 through 62 for pharmaceutical and cosmetic compositions containing a carbohydrate as the active ingredient.

527, Synthetic Resins or Natural Rubbers, subclasses 300 through 315 for a solid polymer derived from a carbohydrate or derivative reactant and an ethylenic reactant, a SICP or a SPFI or a process of preparing said polymer.

530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, subclasses 395 through 398 for glycoproteins such as proteoglycans, mucins, etc.

544, Organic Compounds, appropriate subclasses for purines and pyrimidines which do not have a carbohydrate attached.

549, Organic Compounds, subclass 315 for ascorbic acid; subclasses 356-428 for tetrahydropyrans; and subclasses 429-509 for tetrahydrofurans. Such tetrahydropyrans and tetrahydrofurans lack an –XH or –XR bonded to what would be the anomeric carbon atom of a cyclic saccharide.

562, Organic Compounds, subclasses 512 through 609 for compounds wherein a carboxylic acid group has replaced the carbonyl function of an acyclic carbohydrate, especially subclass 597 for oxalic acid.

564, Organic Compounds, for compounds wherein an amine function has replaced the carbonyl function of an acyclic carbohydrate.

568, Organic Compounds, subclasses 852 through 872 for compounds wherein an alcohol group has replaced the carbonyl group of an acyclic carbohydrate.

2 This subclass is indented under subclass 1.11. Compounds which are pectins and reaction products thereof.

SEE OR SEARCH CLASS:

426, Food or Edible Material: Processes, Compositions, and Products, subclass 577, for food compositions containing pectin.

3 This subclass is indented under subclass 1.11. Compounds which are algins or reaction products thereof.

SEE OR SEARCH CLASS:

426, Food or Edible Material: Processes, Compositions, and Products, subclass 656, for food compositions containing algin.

4.1 O- or S-Glycosides:

This subclass is indented under subclass 1.11. Compounds which an acetal or thiocetal derivatives of the cyclic forms of sugars in which the hydrogen atom of the hemiacetal hydroxyl or hemithioacetal sulfhydryl group has been replaced by an alkyl, aralkyl, or aryl group.

(1) Note. An O- or S- glycoside is basically a compound having a sugar moeity connected to an aglycone moiety via oxygen or sulfur.

(2) Note. On complete hydrolysis these compounds yield one or more monosac-

charides, and mono or polyhydric alcohol or phenol, or sulfur analogs thereof.

(3) Note. The cyclic sugars referred to in the definitions are normally pyranoses or furanoses.

(4) Note. Glycosides derived from aldoses are referred to as aldosides, and those from ketoses are ketosides.

(5) Note. This subclass includes arbutin, amygdalin, and salicin, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
2, for pectins.

SEE OR SEARCH CLASS:
560, Organic Compounds, subclass 68 for tannins some of which are probably glycosides.

4.4 Aescin or derivative:
This subclass is indented under subclass 4.1. Products which consist of a mixture of sapogenin glycosides (saponins) obtained from the seed of the horse chestnut tree (Aesculus hippocastanum).

5 This subclass is indented under subclass 4.1. Compounds in which the aglycone moiety of the glycoside contains a cyclopentanohydrophenanthrene nucleus.

6 This subclass is indented under subclass 5. Compounds wherein a six- membered hetero-O-cyclic substituent is connected directly to a carbon atom of the cyclopentanohydrophenathrene nucleus.

6.1 Oxygen containing five-membered hetero ring:
This subclass is indented under subclass 5. Compounds wherein a five-membered hetero-O-cyclic substitutent is connected directly to a carbon atom of the cyclopentanohydrophenanthrene nucleus.

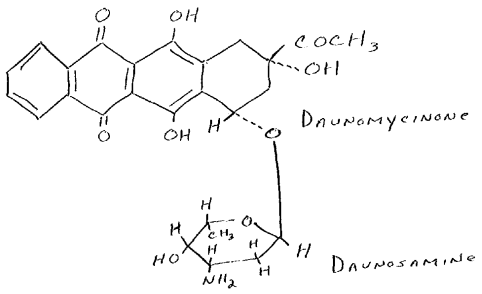
(1) Note. This subclass includes, for example, neutral saponins and glycosides having an aglycone moeity described as cardenolide. Acid saponins (i.e., triterpenoid saponins) are not subject matter for this subclass. For purposes of classification, saponins which are not designated as acid or neutral are considered neutral and are classified herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:
4.1, for acid saponins (i.e., triterpenoid saponins) which are known not to contain the cyclopentanohydrophenanthrene nucleus.
4.4, for aescin or derivatives.

6.2 Nitrogen, phosphorus or halogen containing:
This subclass is indented under subclass 6.1. Compounds which contain nitrogen, phosphourus, or halogen.

6.3 Processes of extracting from plant materials:
This subclass is indented under subclass 6.1. Processes which include extracting the compound from plant materials.

6.4 Daunomycin or derivative:
This subclass is indented under subclass 4.1. Compounds which have the following structural formula and derivatives thereof:



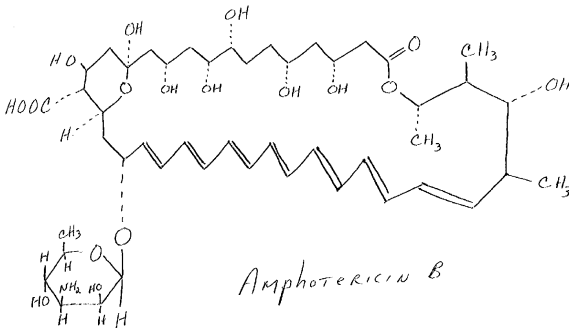
SEE OR SEARCH THIS CLASS, SUBCLASS:
16.8, for glycoside antibiotics structurally similar to daunomycin wherein the anthracycline structure is destroyed or wherein the amino group is removed from daunosamine.
18.7, for daunosamine, per se.

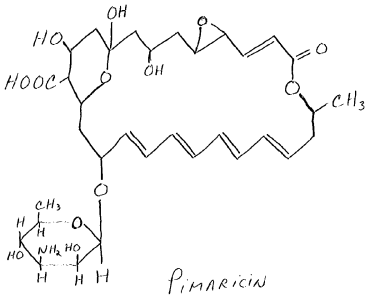
6.5 Oxygen containg hetero ring of at least twenty ring members (e.g., amphotercin, nystatin, pimaricin, etc.):

This subclass is indented under subclass 4.1. Compounds which contain a hetero-O-cyclic substitutent of twenty or more ring members.

(1) Note. The compounds provided for herein are commonly referred to as "macrolide antibiotics" or "polyene macrolide antibiotics". They include a macrocyclic lactone ring with various ketonic an hydroxyl functions glycosidically bound to deoxysugars. As representative of this class of compounds there may be mentioned amphotericin A, amphotericin B, candicidin, nystation, perimycin, and pimaricin.

(2) Note. Examples of compounds provided for herein are:

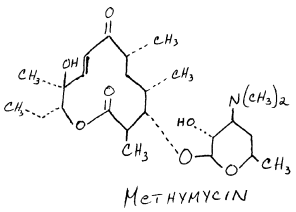


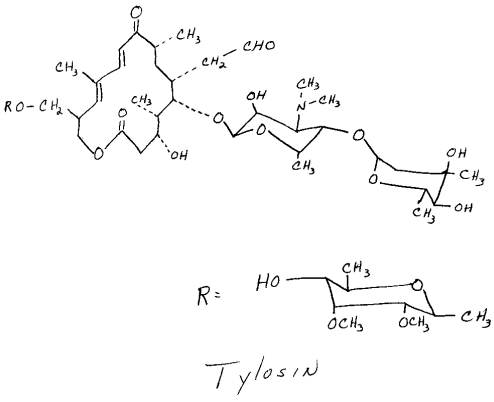


7.1 Oxygen containing hetero ring having 12-19 members (e.g., methymycin, carbomycin, spiramycin, etc.):

This subclass is indented under subclass 4.1. Compounds which contain a hetero-O-cyclic substitutent of twelve or more ring members.

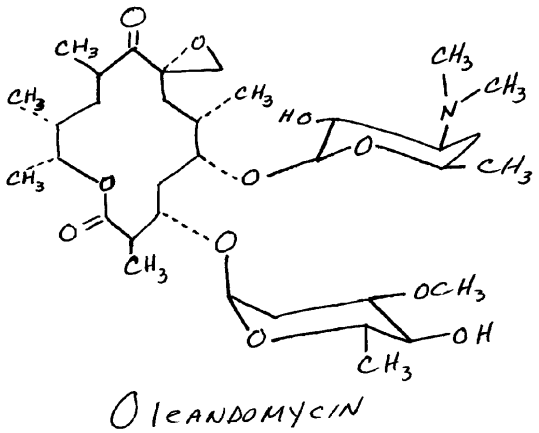
(1) Note. Examples of compounds provided for herein are:





7.2 Erythromycin or derivative (e.g., oleandomycin, etc.):

This subclass is indented under subclass 7.1. Compounds which have the following structure and derivatives thereof wherein the three-part structure shown is not destroyed, and wherein the dimethylamine group of desosamine is not removed, but may be substituted.



SEE OR SEARCH THIS CLASS, SUBCLASS:
7.1, for desdimethylamine erythromycins.
18.7, for desosamine, per se.

7.3 Boron, phosphorus or sulfur containing:
This subclass is indented under subclass 7.2. Compounds which contain boron, phosphorus, or sulfur.

7.4 Additional nitrogen containing:
This subclass is indented under subclass 7.2. Compounds which contain at least one nitrogen other than the desosamine nitrogen.

7.5 Purification or recovery:
This subclass is indented under subclass 7.2. Processes which include separating the compound from impurities or from the reaction mixture.

8 This subclass is indented under subclass 4.1. Compounds which upon hydrolysis yield a sugar, or mixture of sugars, and the anthoxanthins.

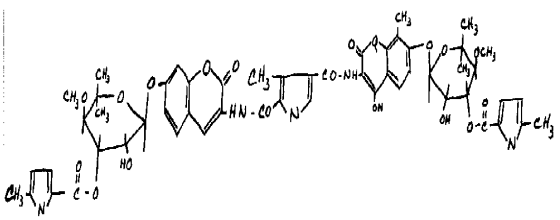
(1) Note. The anthoxanthins include the flavones, the flavonols, the flavonones, the isoflavones and the xanthones.

(2) Note. The compounds are usually plant pigments.

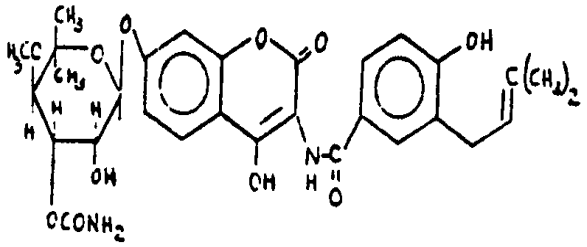
(3) Note. The subclass provides for rutin, quercitrin, hesperidin, citronin and eriodictin, etc.

(4) Note. The flavone moiety is the aglycone portion of the compound.

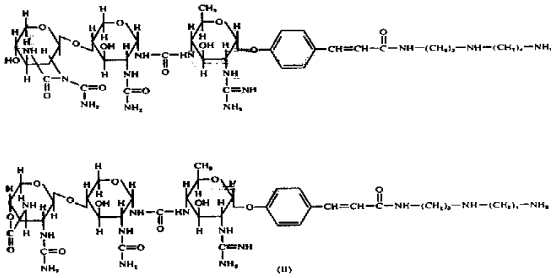
8.8 Coumermycin or derivative:
This subclass is indented under subclass 4.1. Compounds which have the following structural formula (below) and derivatives thereof.:



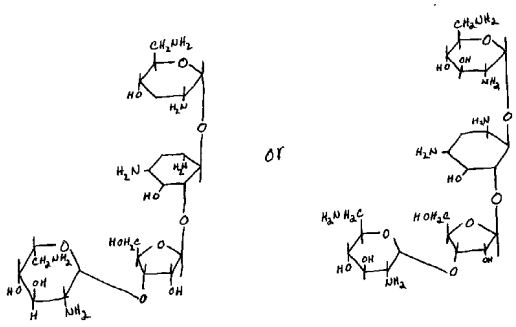
13 This subclass is indented under subclass 4.1. Compounds which have the following structural formula (below) and derivatives thereof.



13.1 Antibiotic BM 123 or derivative:
This subclass is indented under subclass 4.1. Compounds which have the following isomeric structural formulae (below) and derivatives thereof.:

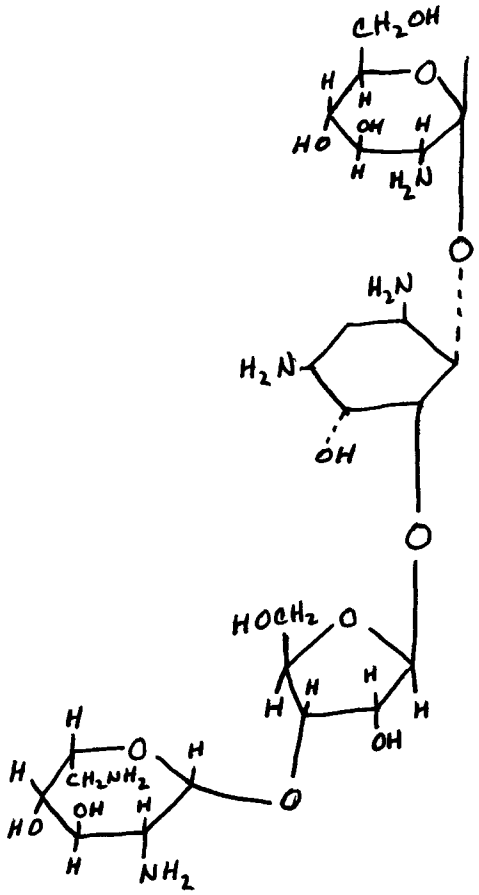


13.2 Neomycin B or neomycin C or derivative:
This subclass is indented under subclass 4.1. Compounds which have the following structural formulae (below): and derivatives, complexes, or mixtures thereof.



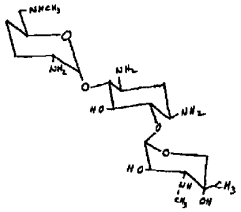
13.3 Paromomycin or derivative (e.g., neomycin E, etc.):

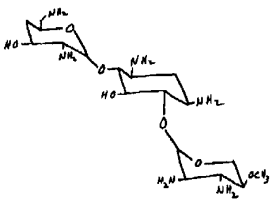
This subclass is indented under subclass 4.1. Compounds which have the following structural formula (below) and derivatives thereof.:



13.4 Antibiotic XK or derivative:

This subclass is indented under subclass 4.1. Compounds which may have any of the following structural formulae (below) and derivatives thereof.

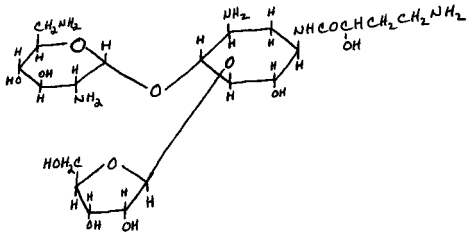




(1) Note. Included herein are antibiotics of the XK-88 series, such as XK-88-5, also named seldomycin factor 5, and those of the XK-62 series, such as XK-62-2.

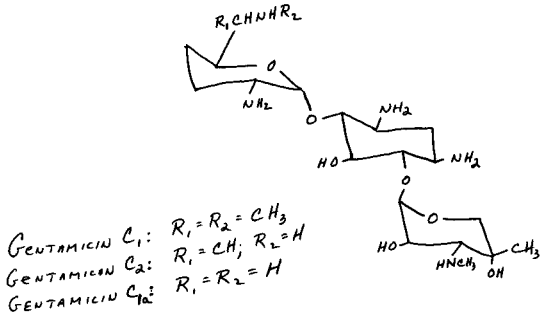
13.5 Butirosin or derivative (e.g., ambutyrosin, etc.):

This subclass is indented under subclass 4.1. Compounds which have the following structural formula (below) and derivatives thereof.



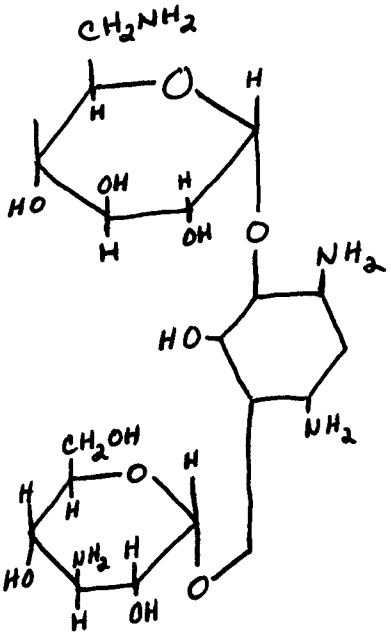
13.6 Gentamicin or derivative:

This subclass is indented under subclass 4.1. Compounds which have the folllowing structural formula (below) and derivatives thereof.



13.7 Kanamycin or derivative:

This subclass is indented under subclass 4.1. Compounds which have the following structural formula: (below) and derivatives thereof.

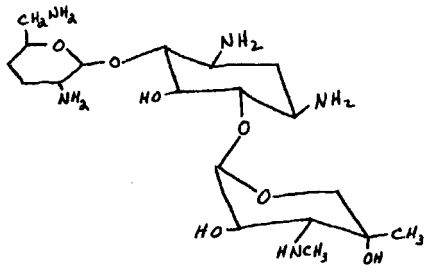


13.8 Carbonyl bonded directly to kanamycin nitrogen:

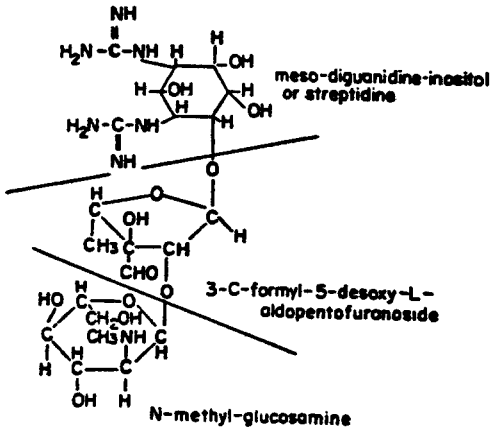
This subclass is indented under subclass 13.7. Compounds which include at least one carbonyl group directly bonded to a nitrogen of kanamycin.

13.9 Sisomicin or derivative:

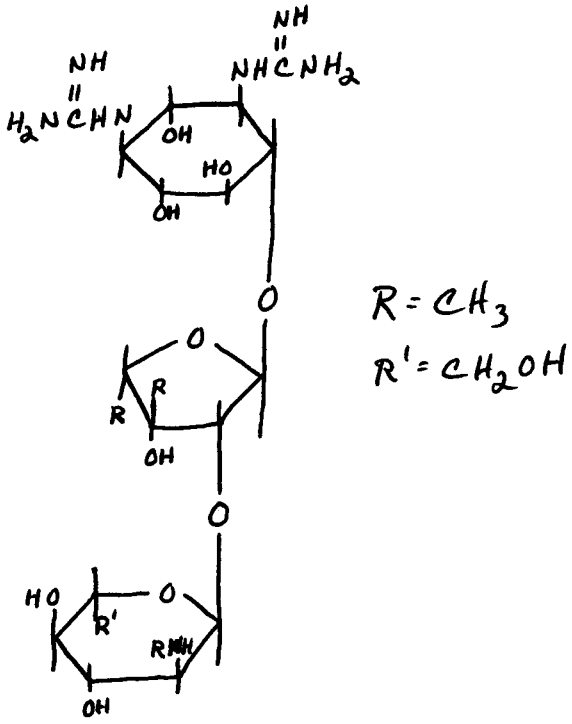
This subclass is indented under subclass 4.1. Compoounds which have the following structural formula (below) and derivatives thereof.



14 This subclass is indented under subclass 4.1. Compounds which have the following structural formula (below) or which have the structure of any of the three main components shown in the formula; and derivatives thereof.



15 This subclass is indented under subclass 14. Compounds which are reduction products of streptomycin and have the following formula (below) and derivatives thereof.

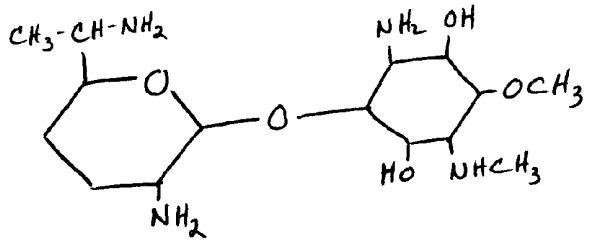


16 This subclass is indented under subclass 14. Compounds which result from an addition-type reaction of streptomycin, or a derivative thereof, with another compound.

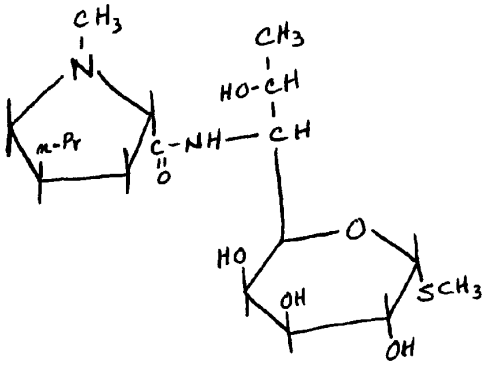
(1) Note. This subclass provides for the addition salts formed by reacting strepto-

mycin with metal halides, organic amines, organic or inorganic acids, etc.

16.1 Fortimicin or derivative:
This subclass is indented under subclass 4.1. Compounds which have the following structural formula (below) and derivatives thereof.



16.2 Lincomycin or derivative:
This subclass is indented under subclass 4.1. Compounds which have the following structural formula (below) and derivatives thereof.

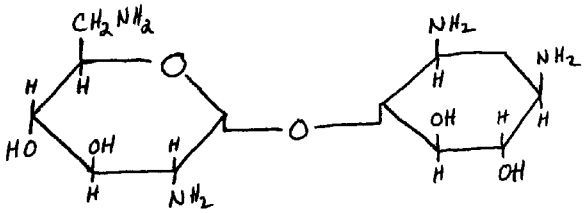


16.3 Cyano or -COO- containing:
This subclass is indented under subclass 16.2. Compounds which contain a -CN or -COO group.

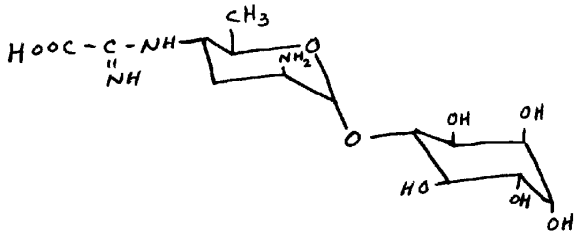
16.4 Additional sulfur containing:
This subclass is indented under subclass 16.2. Compounds which contain at least two sulfurs.

16.5 Phosphorus or halogen containing:
This subclass is indented under subclass 16.2. Compounds which contain phosphorus or halogen.

16.6 Neamine or derivative (e.g., neomycin A, etc.):
This subclass is indented under subclass 4.1. Compounds which have the following structural formula (below) and derivatives thereof.



16.7 Kasugamycin or derivative:
This subclass is indented under subclass 4.1. Compounds which have the following structural formula (below) and derivatives thereof.



16.8 Antibiotics:
This subclass is indented under subclass 4.1. Compounds which have the capacity to inhibit the growth of or destroy micro-organisms and are generally emplyed to kill disease in aperson or animal.

(1) Note. Anibiotics are generally produced by a bacterium or fungus, however, such processes are not provided for herein.

(2) Note. The compound may be antibacterial or antifungal.

(3) Note. This subclass provides for antibiotics which are not provided for in specific antibiotic subclasses above.

SEE OR SEARCH CLASS:

435, Chemistry: Molecular Biology And Microbiology, for processes of making antibiotics by cultivating microoganisms.

16.9 Purification or recovery:
This subclass is indented under subclass 16.8. Processes which include separating the antibiotic(s) from inpurities or from the reaction mixture.

17.1 Boron, phosphorus, heavey metal or aluminum containing:
This subclass is indented under subclass 4.1. Compounds which contain boron, phosphorus, a metal having a specific gravity greater than four, or aluminum.

17.2 Nitrogen containing:
This subclass is indented under subclass 4.1. Compound which contain nitrogen.

17.3 Nitrogen containing hetero ring:
This subclass is indented under subclass 17.2. Compounds which contain nitrogen containing heterocyclic ring.

17.4 Nitrogen in aglycone moiety:
This subclass is indented under subclass 17.3. Compound which contain nitrogen in the aglycone (nonsugar) moiety of the glycoside.

17.5 Sulfur containing (e.g., methylthiolincosaminide, etc.).:
This subclass is indented under subclass 17.2. Compounds which contain sulfur.

17.6 Nitrogen or sulfur in aglycone moiety:
This subclass is indented under subclass 17.5. Compounds which contain nitrogen or sulfur in the aglycone (nonsugar) moiety of the glycoside.

17.7 Nitro or nitroso containing:
This subclass is indented under subclass 17.2. Compounds which contain nitro or nitroso.

17.8 Nitrogen in aglycone moiety:
This subclass is indented under subclass 17.7. Compounds which contain nitrogen in the aglycone (nonsugar) moiety of the glycoside.

17.9 Nitrogen in aglycone moiety:
This subclass is indented under subclass 17.2. Compounds which contain nitrogen in the aglycone (nonsugar) moiety of the glycoside.

18.1 Polycyclo ring system (e.g., hellebrin, etc.):
This subclass is indented under subclass 4.1. Compounds which contain a polycyclo ring system.

18.2 Containing -C(=X)X- wherein the X's are the same or diverse chalcogens:
This subclass is indented under subclass 4.1. Compounds which contain a -C(=X)X- group wherein the X's are the same of diffierent and are O, S, Se, or Te.

18.3 Plural oxyalkylene groups bonded directly to each other.
This subclass is indented under subclass 4.1. Compounds which contain two or more successive oxyalkylene groups.

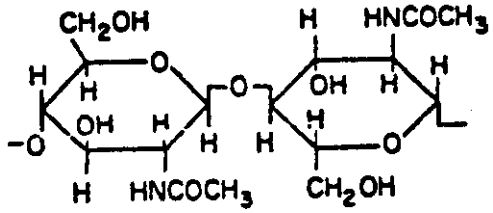
18.4 Halogen containing:
This subclass is indented under subclass 4.1. Compounds which contain halogen.

18.5 Processses:
This subclass is indented under subclass 4.1. Processes which are directed to the preparation, purification, recovery, stabilization of treatment of an O- or S- glycoside.

18.6 Reacting a carbohydrate with an organic -O- containing compound (e.g., reacting glucose with methanol, etc.)
This subclass is indented under subclass 18.5. Processes which include perparing the glycoside by reacting a carbohydrate with an organic compound containing -O-.

18.7 Nitrogen containing:
This subclass is indented under subclass 1.1. Compounds which are nitrogen containing derivatives of carbohydrates.

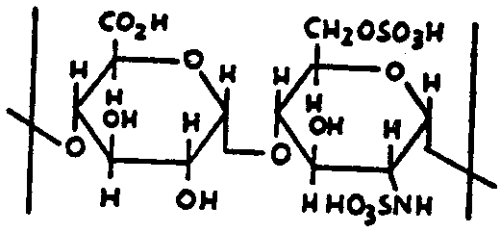
20 This subclass is indented under subclass 18.7. Compounds which upon acid hydrolysis yield acetylglucosamine and which are polysaccharides having the following repeating unit (below) and derivatives thereof.



Repeating unit of chitin

(1) Note. Chitin is a horny substance that forms part of the hard outer shell of insects and crustaceans and is structurally similar to cellulose.

21 This subclass is indented under subclass 18.7. Compounds which are polysaccharides containing the following repeating unit wherein the degree of sulfation of the individual components in the polysaccharide is apparently not uniform and may vary at different areas of the carbohydrate chain, and derivatives thereof.



(1) Note. Heparin is a natural substance which can be found in various tissues of mammals, especially the lung, spleen, liver and muscle, and has been used medicinally for coagulation of blood and metabolism of lipids.

22.1 N-glycosides, polymers thereof, metal derivatives (e.g., nucleic acids, oligonucleotides, etc.):

This subclass is indented under subclass 18.7. Compounds which are glycosidic derivatives of the cyclic forms of sugars in which the aglycone portion is attached thru nitrogen to the sugar moiety by substituting it for the hemiacetal hydroxyl of the sugar.

(1) Note. The compounds included herein are N-glycosides, nucleic acids, oligonucleotides, metal derivatives of nucleic acids, etc.

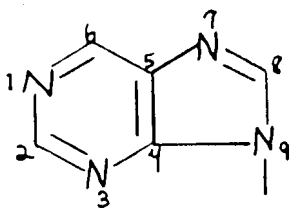
(2) Note. A nucleoside is an N-glycoside wherein the aglycone portion is a pyrimidine ring or a purine ring system attached thru ring nitrogen to a pentose sugar (either a ribose or a deoxyribose).

(3) Note. A nucleotide is a phosphorylated nucleoside.

(4) Note. Polynucleotides, also called nucleic acids, are covalently linked series of nucleotides in which the 3i position of the pentose of one nucleotide is joined by a phosphodiester group to the 5i position of the next.

(5) Note. DNA (deoxyribonucleic acid) and RNA (ribonucleic acid) are biologically occurring polynucleotides in which the nucleotide residues are linked in a specific sequence by phosphodiester linkages.

(6) Note. The numbering of the members of the purine ring system in these subclasses does not follow the Ring Index numbering system. The numbering system followed is:



SEE OR SEARCH THIS CLASS, SUBCLASS:

4+, for glycosides wherein the aglycone moiety is attached to the sugar portion through an oxygen or sulfur atom.

25.5, for homopolymers wherein the monomeric unit is a nucleotide or a nucleoside.

SEE OR SEARCH CLASS:

544, Organic Compounds, subclass 243 for nucleotide analogs which are not glycosides.

23.1 DNA or RNA fragments or modified forms thereof (e.g., genes, etc.):

This subclass is indented under subclass 22.1. Compounds which are fragments of nucleic acid having a specific sequence of deoxyribonucleotide units, or ribonucleotide units, linked by successive 3i-5i phosphodiester linkages, or modified derivatives thereof.

(1) Note. A gene is a fragment of DNA that encodes a specific polypeptide in a recombinant process.

(2) Note. "Encodes" means that the fragment of DNA specifies the amino acid sequence of the polypeptide expressed by a microorganism that has been transformed with such fragment of DNA.

(3) Note. For purposes of this class the term microorganism includes bacteria, actinomycetales, cyanobacteria (unicellular algae), fungi, protozoa, animal cells, plant cells, and virus.

SEE OR SEARCH THIS CLASS, SUBCLASS:

24.1, for non-coding sequences which control transcription or translation.

SEE OR SEARCH CLASS:

435, Chemistry: Molecular Biology and Microbiology, subclasses 69.1+ and 440+ for recombinant processes that utilize DNA fragments and subclass 320.1 for plasmids (circular extrachromosomal self replicating fragments of DNA).

436, Chemistry: Analytical and Immunological Testing, appropriate subclasses for monenzymatic analytical processes which test for, or utilize, N-glycosides, polynucleotides, or polynucleosides.

514, Drug, Bio-Affecting, and Body Treating Compositions, appropriate subclasses for therapeutic composition and methods of using DNA fragments, RNA fragments, nucleotides, or nucleosides.

530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, appropriate subclasses for polypeptides or proteins that are products obtained from recombinant processes that utilize fragments of DNA.

23.2 Encodes an enzyme:

This subclass is indented under subclass 23.1. Compounds which are DNA fragments which encode specific enzymes.

SEE OR SEARCH CLASS:

435, Chemistry: Molecular Biology and Microbiology, subclass 172.3 for recombinant processes which utilize fragments of DNA.

23.4 Encodes a fusion protein:

This subclass is indented under subclass 23.1. Compounds which are DNA fragments which encode specific fusion proteins.

SEE OR SEARCH CLASS:

435, Chemistry: Molecular Biology and Microbiology, subclass 172.3 for recombinant processes which utilize fragments of DNA.

23.5 Encodes an animal polypeptide:

This subclass is indented under subclass 23.1. Compounds which are DNA fragments which encode specific animal polypeptides.

SEE OR SEARCH CLASS:

435, Chemistry: Molecular Biology and Microbiology, subclass 172.3 for recombinant processes which utilize fragments of DNA.

23.51 Hormone:

This subclass is indented under subclass 23.5. Compounds which are DNA fragments which encode specific hormones.

SEE OR SEARCH CLASS:

435, Chemistry: Molecular Biology and Microbiology, subclass 172.3 for recombinant processes which utilize fragments of DNA.

23.52 Interferon:
This subclass is indented under subclass 23.5. Compounds which are DNA fragments which encode specific interferons.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclass 172.3 for recombinant processes which utilize fragments of DNA.

23.53 Immunoglobulin:
This subclass is indented under subclass 23.5. Compounds which are DNA fragments which encode specific immunoglobulins.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclass 172.3 for recombinant processes which utilize fragments of DNA.

23.6 Encodes a plant polypeptide:
This subclass is indented under subclass 23.1. Compounds which are DNA fragments which encode specific plant polypeptides.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclass 172.3 for recombinant processes which utilize fragments of DNA.

23.7 Encodes a microbial polypeptide:
This subclass is indented under subclass 23.1. Compounds which are DNA fragments which encode specific microbial polypeptides.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclass 172.3 for recombinant processes which utilize fragments of DNA.

23.71 Bacillus thuringiensis insect toxin:
This subclass is indented under subclass 23.7. Compounds which are DNA fragments which encode Bacillus thuringiensis insect toxins.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclasses 440+ for recombinant processes which utilize fragments of DNA.

23.72 Viral protein:
This subclass is indented under subclass 23.7. Compounds which are DNA fragments which encode specific viral proteins.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclasses 440+ for recombinant processes which utilize fragments of DNA.

23.74 Fungal protein:
This subclass is indented under subclass 23.7. Compounds which are DNA fragments encode specific fungal proteins.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclass 172.3 for recombinant processes which utilize fragments of DNA.

24.1 Non-coding sequences which control transcription or translation processes (e.g., promoters, operators, enhancers, ribosome binding sites, etc.):
This subclass is indented under subclass 23.1. Fragments of DNA which are sequences of nucleotides which do not encode polypeptides in recombinant processes, but which regulate the expression of such chemical compounds in such processes.

(1) Note. Included herein are such compounds as promoters, operators, ribosome binding sites, enhancers, etc.

24.2 Non-coding sequences having no known regulatory function and which are adaptors or linkers for vector or gene construction:
This subclass is indented under subclass 23.1. Compounds which are fragments of DNA, which have utility in constructing a desired gene or in the insertion of genetic material into a vector.

(1) Note. A vector is a vehicle employed to introduce a nucleic acid sequence, or gene, into a cell.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclass 320.1 for vectors.

24.3 Probes for detection of specific nucleotide sequences or primers for the synthesis of DNA or RNA:
This subclass is indented under subclass 23.1. Fragments of nucleic acids which have utility as probes for the detection of specific nucleotide sequences, or as primers for the synthesis of DNA or RNA.

(1) Note. A probe is a single strand of DNA or RNA which could be labelled, and which hybridizes by complementary base pairing with another single strand of DNA or RNA.

(2) Note. A primer is a sequence of nucleotides which is used in the synthesis of DNA or RNA.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclass 6 for analytical processes that utilize probes for detecting the presence, or absence, of a particular nucleotide sequence.

24.31 Probes for detection of animal nucleotide sequences:
This subclass is indented under subclass 24.3. Fragments of nucleic acid which are single strands of DNA or RNA with utility in analytical processes for the detection of complementary nucleotide sequences of animal origin.

24.32 Probes for detection of microbial nucleotide sequences:
This subclass is indented under subclass 24.3. Fragments of nucleic acid which are single strands of DNA or RNA with utility in analytical processes for the detection of complementary nucleotide sequences of microbial origin.

24.33 Primers:
This subclass is indented under subclass 24.3. Fragments of nucleic acids which have utility as primers.

(1) Note. A primer is a sequence of nucleotides which is used in the synthesis of DNA or RNA.

24.5 Nucleic acid expression inhibitors:
This subclass is indented under subclass 23.1. Fragments of DNA or RNA which are effective inhibitors of transcription or translation.

(1) Note. Transcription is the process by which the genetic information contained in a fragment of DNA specifies the complementary sequence of bases in an RNA chain.

(2) Note. Translation is the process by which the genetic information contained in a fragment of RNA directs or specifies the sequence of amino acids in polypeptide synthesis.

25.1 3i-5i linked RNA:
This subclass is indented under subclass 22.1. Compounds which are polyribonucleotides of a specific sequence wherein the ribonucleotide units are linked by 3i-5i phosphodiester linkages.

25.2 2i-5i linked RNA:
This subclass is indented under subclass 22.1. Compounds which are polyribonucleotides of a specific sequence wherein theribonucleotide units are linked by 2i-5i phosphodiester linkages.

25.3 Synthesis of polynucleotides or oligonucleotides:
This subclass is indented under subclass 22.1. Process for the synthesis of polynucleotides or oligonucleotides, which process may be, or include, a crosslinking step.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, appropriate subclasses for processes for the synthesis of polynucleotides or oligonucleotides

that utilize a microorganism or an enzyme.

25.31 Deprotection step:
This subclass is indented under subclass 25.3. Processes for the synthesis of polynucleotides or oligonucleotides which include a deprotection step.

25.32 Labels or markers utilized (e.g., radiotracer, affinity, fluorescent, phosphorescent markers, etc.):
This subclass is indented under subclass 25.3. Processes for the synthesis of polynucleotides or oligonucleotides in which a label or marker is used to indicate the presence of a particular product.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclasses 91.1+ for processes of synthesizing polynucleotides or oligonucleotides which include an enzyme utilized as a label or in any other category.

25.33 Pentavalent phosphorus compound utilized:
This subclass is indented under subclass 25.3. Processes for the synthesis of polynucleotides and oligonucleotides which utilize pentavalent phosphorus compounds.

25.34 Trivalent phosphorus compound utilized:
This subclass is indented under subclass 25.3. Processes for the synthesis of polynucleotides and oligonucleotides which utilize trivalent phosphorus compounds.

25.4 Separation or purification of polynucleotides or oligonucleotides:
This subclass is indented under subclass 22.1. Processes for the purification or separation of polynucleotides or oligonucleotides.

SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, appropriate subclasses for processes for the purification or separation of polynucleotides or olygonucleotides that utilize a microorganism or an enzyme.

25.41 Extraction processes (e.g., solvent extraction process, etc.):
This subclass is indented under subclass 25.4. Processes for the purification or separation of polynucleotides or oligonucleotides which include extraction steps, e.g., solvent extraction processes, etc.

25.42 Denaturant utilized:
This subclass is indented under subclass 25.41. Processes for the separation or purification of polynucleotides or oligonucleotides which include extraction steps, which processes utilize a denaturant.

25.5 Homopolymers having repeating sequences of four or more identical nucleotide units:
This subclass is indented under subclass 22.1. Polynucleotides consisting of four or more identical nucleotide units linked by phosphodiester linkages.

25.6 Nucleic acids which include two or three nucleotide units:
This subclass is indented under subclass 22.1. Compounds which include two or three nucleotide units linked by phosphodiester linkages.

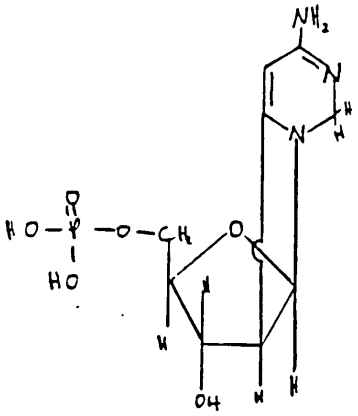
(1) Note. Each unit has to be a nucleotide unit, i.e., a phosphoesterified nucleoside.

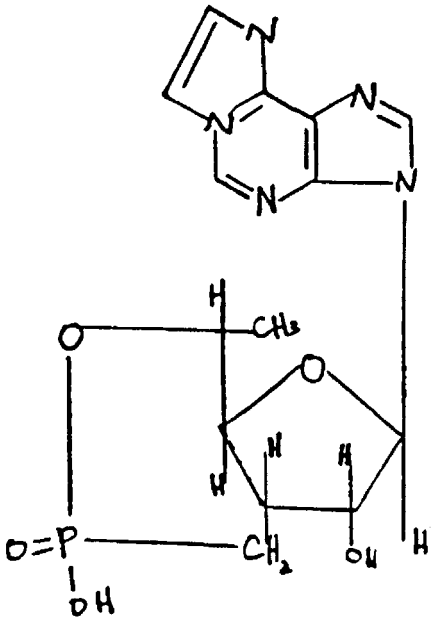
SEE OR SEARCH THIS CLASS, SUBCLASS:
26.5, for plural N-glycosides bonded to the same phosphorus ester group wherein the N is part of a nitrogen containing hetero ring.

26.1 Phosphorus containing N-glycoside wherein the N is part of an N-hetero ring:
This subclass is indented under subclass 22.1. Compounds which are N-glycosides which contain phosphorus and wherein the N of the N-glycoside moiety is part of a nitrogen containing hetero ring.

(1) Note. Nucleotides are provided for in this and indented subclasses.

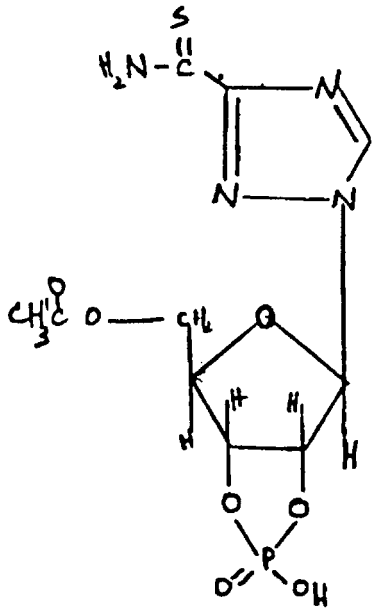
(2) Note. An example of a compound provided for herein is:





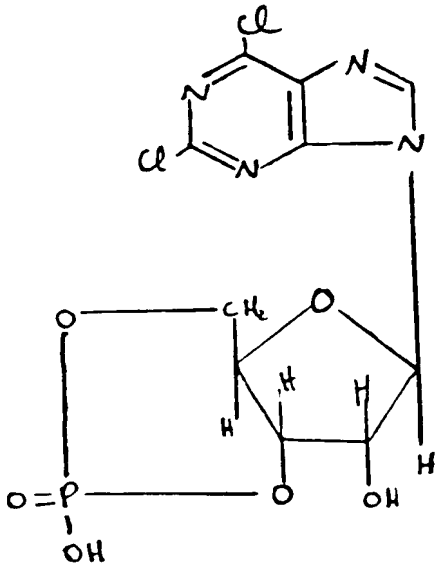
26.11 The phosphorus is part of a ring:
This subclass is indented under subclass 26.1. Compounds wherein the phosphorus is part of a ring structure.

(1) Note. Examples of compounds provided for herein are:



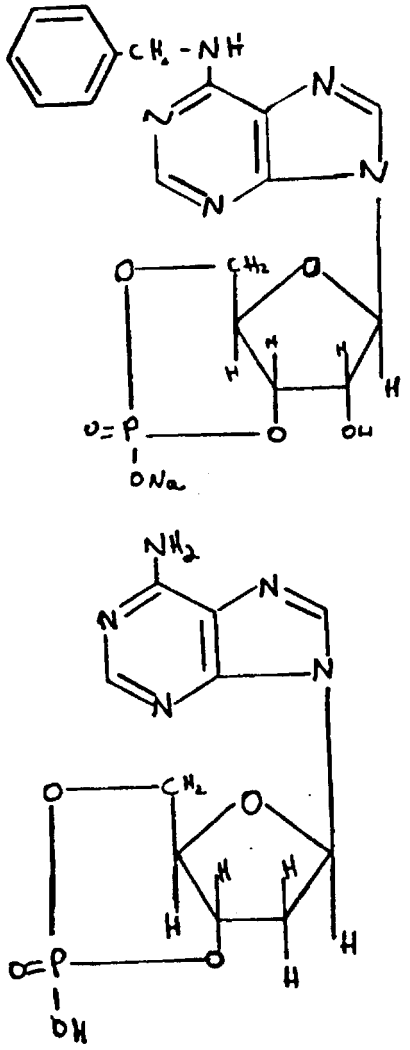
26.12 The N-hetero ring is part of a purine ring system:
This subclass is indented under subclass 26.11. Compounds in which the nitrogen containing hetero ring is part of a purine ring system.

(1) Note. An example of a compound provided for herein is:



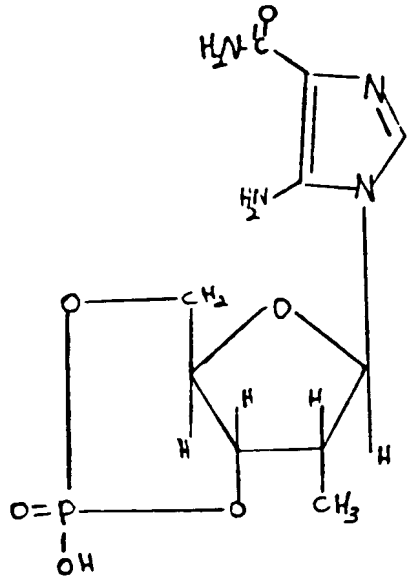
26.13 Adenine or substituted adenine:
This subclass is indented under subclass 26.12. Compounds in which the purine ring system is adenine, i.e., 6-aminopurine, which may be substituted.

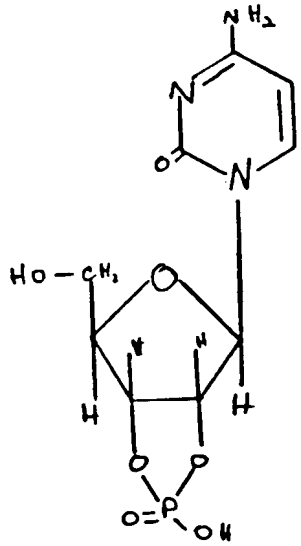
(1) Note. Examples of compounds provided for herein are:



26.14 The N-hetero ring is a diazine or a diazole ring, including hydrogenated:
This subclass is indented under subclass 26.11. Compounds in which the nitrogen containing hetero ring is a diazine ring, i.e., a six-membered hetero ring with two nitrogens and four carbons, or a diazole ring, i.e., a five-membered hetero ring with two nitrogens and three carbons, which nitrogen containing hetero ring could be hydrogenated.

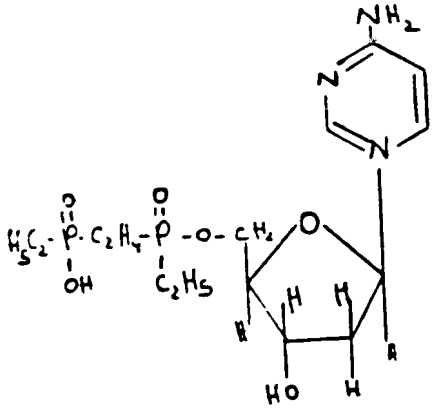
(1) Note. Examples of compounds provided for herein are:

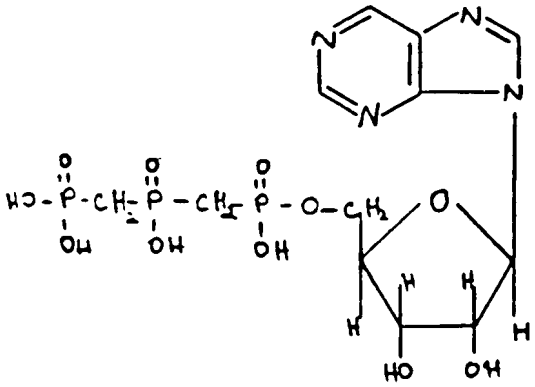




26.2 Plural phosphorus atoms in N-glycoside:
This subclass is indented under subclass 26.1. Compounds which contain more than one phosphorus atom.

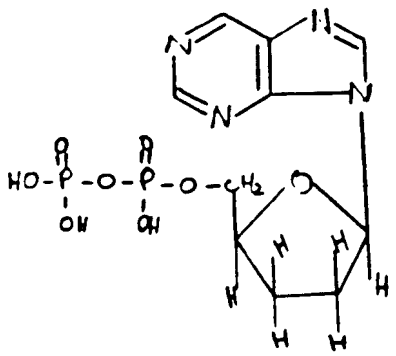
(1) Note. Examples of compounds provided for herein are:





26.21 Plural phosphorus atoms bonded directly to the same chalcogen in a chain (e.g., pyrophosphates, polyanhydrides of phosphorus acids, etc.):
This subclass is indented under subclass 26.2. Compounds which contain two phosphorus bonded directly to the same chalcogen (i.e., oxygen, sulfur selenium or tellurium) in a chain.

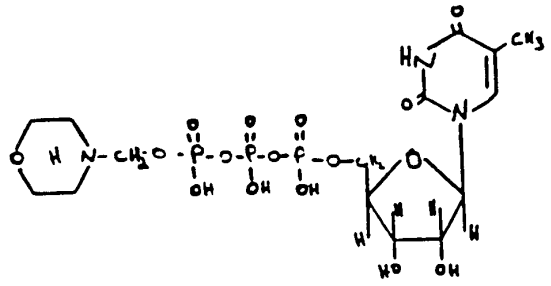
(1) Note. An example of a compound provided for herein is:

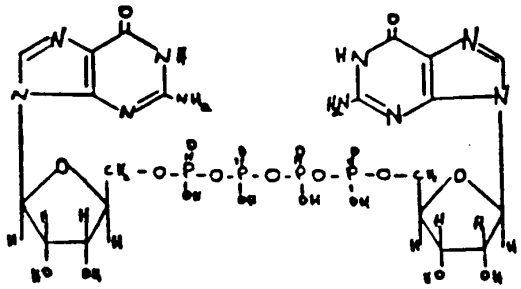


26.22 Both terminal phosphorus atoms are esterified by organic groups wherein one of these organic groups is the sugar moiety:

This subclass is indented under subclass 26.21. Compounds wherein both terminal phosphorus atoms are esterified by organic groups wherein one of the organic groups is the sugar moiety.

(1) Note. Examples of compounds provided for herein are:



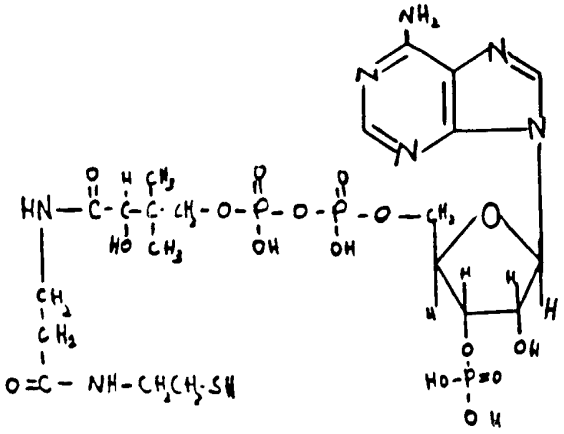


uridine diphosphate glucose

26.23 Exactly two phosphorus atoms in the chain (e.g., coenzyme A, etc.):

This subclass is indented under subclass 26.22. Compounds in which the chain consists of two phosphorus groups bonded directly to the same chalcogen in the chain.

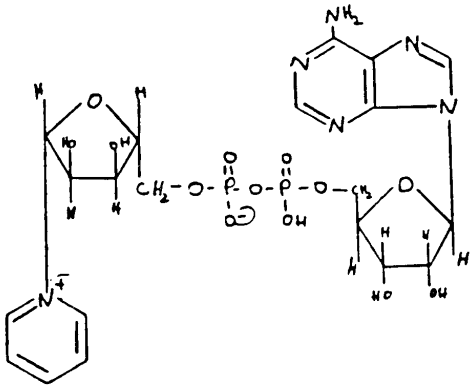
(1) Note. Examples of compounds provided for herein are:



coenzyme A

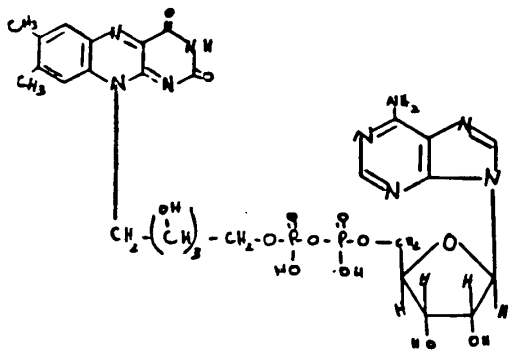
26.24 NAD (nicotinamide adenine dinucleotide) and derivatives thereof:
This subclass is indented under subclass 26.23. The compound which is nicotinamide adenine dinucleotide and derivatives thereof.

(1) Note. The structure for nicotinamide adenine dinucleotide is:



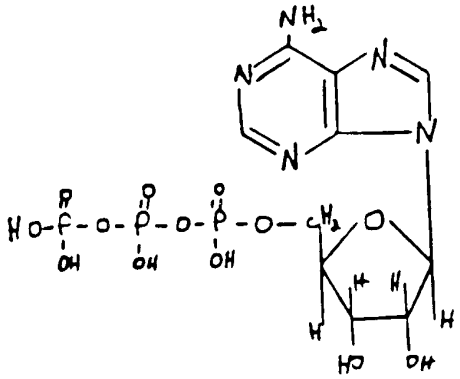
26.25 FAD (flavin adenine dinucleotide) and derivatives thereof:
This subclass is indented under subclass 26.23. The compound which is flavin adenine dinucleotide and derivatives thereof.

(1) Note. The structure for flavin adenine dinucleotide is:



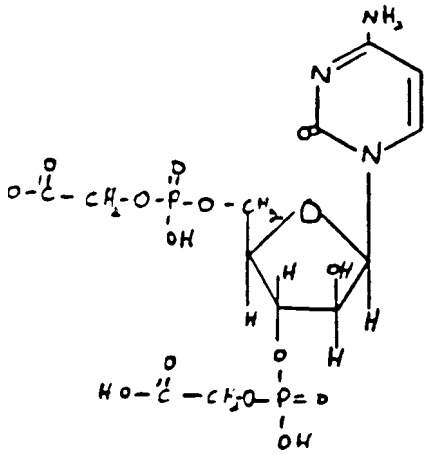
26.26 Triphosphates (in same chain):
This subclass is indented under subclass 26.21. Compounds which contain a chain of three phosphorus joined by chalcogen atoms.

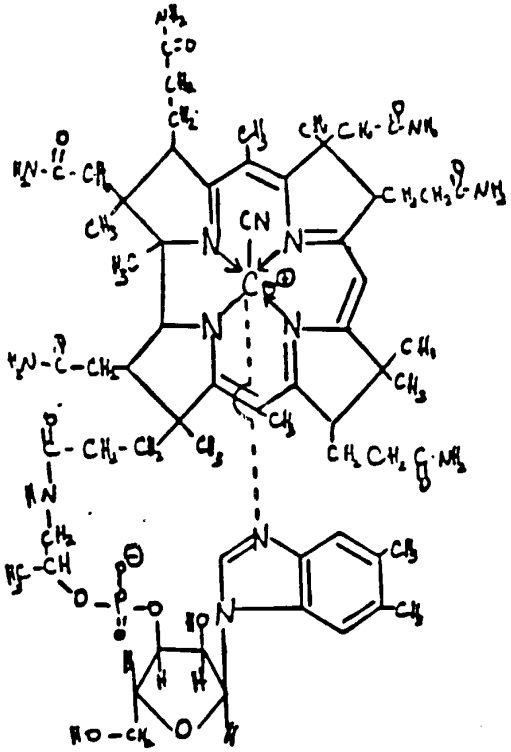
(1) Note. An example of a compound provided for herein is adenosine triphosphate:



26.3 Plural monophosphate groups (e.g., adenosine -3i,5i- biscarboxymethyl phosphonate, cytidine nucleoside diphosphate, etc.):
This subclass is indented under subclass 26.2. Compounds which include two or more monophosphate groups attached indirectly to each other.

(1) Note. An example of a compound provided for herein is:





26.4 Cobalamin nucleotides (e.g., vitamin B-12, etc.):

This subclass is indented under subclass 26.1. Compounds which are cobalt containing nucleotides.

(1) Note. An example of a compound provided for herein is vitamin B-12.

26.41 Processes of preparing or labelling:

This subclass is indented under subclass 26.4. Processes for the preparation of cobalamin nucleotide compounds or for the labelling of these compounds.

26.42 Processes of concentration, separation, recovery, or extraction (e.g., recovery from organ extracts, from fermentation broth, from sewage sludge, etc.):

This subclass is indented under subclass 26.4. Processes for the separation, extraction, recovery, or concentration of cobalamin nucleotide compounds.

26.43 Adsorbent used (e.g., activated alumina, ion exchange resins, etc.):

This subclass is indented under subclass 26.42. Processes for the separation, extraction, recovery or concentration wherein an adsorbent is used.

26.44 Cobalamin analogs (i.e., compounds wherein the benzimidazole ring system has

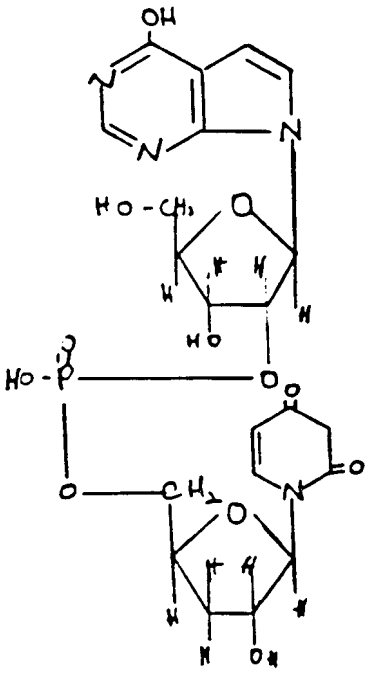
been replaced by another organic ring structure, or compounds wherein cobalt has been removed or replaced by another metal, or is substituted by a group other than -OH or -CN):

This subclass is indented under subclass 26.1. Compounds which are cobalamin analogs, e.g., compounds wherein the benzimidazole ring system has been replaced by another ring structure, or wherein the cobalt metal has been removed or replaced by another metal or the cobalt is substituted by a group other than -OH or -CN, etc.

26.5 Plural N-glycosidic moieties bonded to the same phosphorus ester group:

This subclass is indented under subclass 26.1. Compounds wherein plural N-glycosidic groups are bonded directly to the same phosphorus ester group.

(1) Note. An example of a compound provided for herein is:



SEE OR SEARCH THIS CLASS, SUBCLASS:

25.6, for nucleic acids which include two or three nucleotide units linked by phosphodiester linkages.

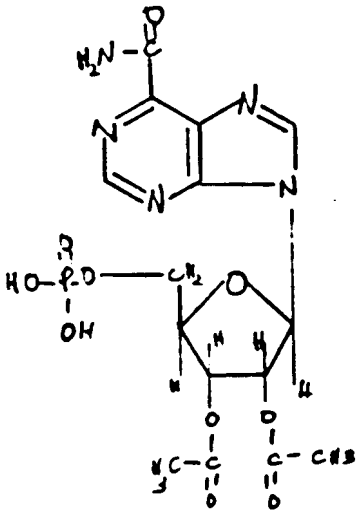
26.6 Labelled (e.g., tagged with radioactive tracer, fluorescent marker, intercalator, etc.):

This subclass is indented under subclass 26.1. Compounds to which a marker (chemical, radioactive, fluorescent, etc.) has been added to indicate its presence.

26.7 The N-hetero ring is part of a bicyclic ring system:

This subclass is indented under subclass 26.1. Compounds wherein the N-hetero ring is part of a bicyclic hetero ring system.

(1) Note. An example of a compound provided for herein is:



26.71 Preparing purine nucleotides:

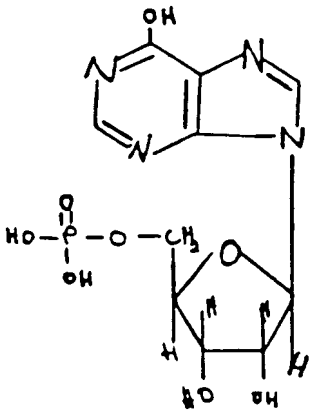
This subclass is indented under subclass 26.7. Processes for the preparation of purine nucleotides.

26.72 Guanosine nucleotide preparation:
This subclass is indented under subclass 26.71. Processes for the preparation of guanosine nucleotide.

26.73 Separation or purification of purine nucleotides:
This subclass is indented under subclass 26.7. Processes for the separation or purification of purine nucleotides.

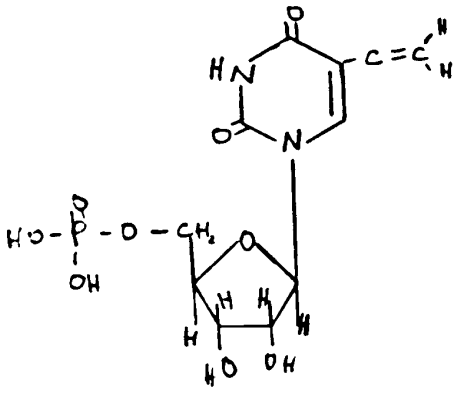
26.74 Inosine nucleotide:
This subclass is indented under subclass 26.7. The compound which is inosine nucleotide.

(1) Note. The compound provided for herein is:



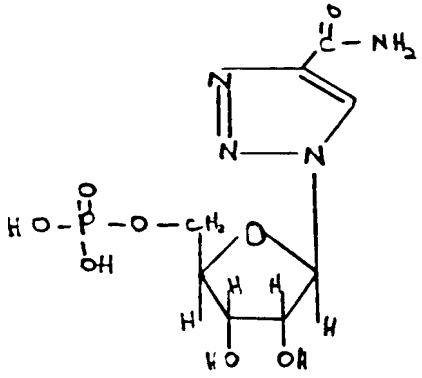
26.8 The N-hetero ring is six-membered and monocyclic (e.g., uridine-5i-monophosphate, etc.):
This subclass is indented under subclass 26.1. Compounds wherein the N-hetero ring is six-membered and is not part of a polycyclic ring system.

(1) Note. An example of a compound provided for herein is:



26.9 The N-hetero ring is five-membered (e.g., l-b-D-ribofuranosyl-1,2,3-triazole-4-carboxamide-5i-phosphate, etc.):
This subclass is indented under subclass 26.1. Compounds wherein the N-hetero ring is five-membered.

(1) Note. An example of a compound provided for herein is:



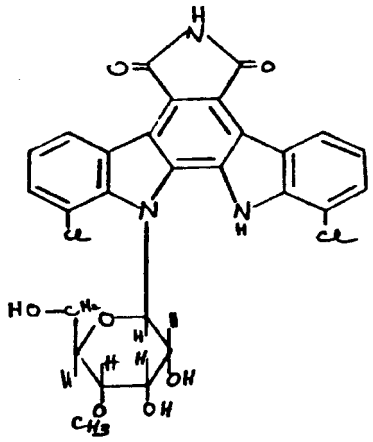
27.1 N-glycosides wherein the N is part of an N-hetero ring which hetero ring is part of a polycyclo ring system containing an N-hetero ring and an additional hetero ring (e.g., rebeccamycin, etc.):
This subclass is indented under subclass 22.1. Compounds which are N-glycosylamines wherein the N of the N-glycoside moiety is part of a nitrogen containing hetero ring which hetero ring is part of a polycyclo ring system that

contains the N-hetero ring and an additional hetero ring.

(1) Note. This and indented subclasses do not provide for compounds that contain a phosphorus ester group attached to the sugar moiety.

(2) Note. Nucleosides are provided for in this and indented subclasses.

(3) Note. An example of a compound provided for herein is rebeccamycin:



SEE OR SEARCH THIS CLASS, SUBCLASS:

26.1+, for nucleotides, i.e., phosphorus containing nucleosides.

27.11 Preparing by cleaving nucleic acids or by attaching an N-heterocyclic base to a sugar ring:

This subclass is indented under subclass 27.1. Processes for the preparation of N-hetero glycosides which include cleaving (degradation) of nucleic acids or bonding an N-heterocyclic base to a sugar ring.

(1) Note. Chemical cleaving (degradation) of nucleic acids is provided for in this subclass.

SEE OR SEARCH CLASS:

435, Chemistry: Molecular Biology and Microbiology, subclasses 85+ for processes of cleaving nucleic acids which utilize a micro-organism or an enzyme.

27.12 Separation or purification (e.g., resolving isomeric mixtures, etc.):

This subclass is indented under subclass 27.1. Processes for the separation, isolation, or purification of the N-hetero glycosides.

(1) Note. Chemical processes for resolving isomeric mixtures are included in this subclass.

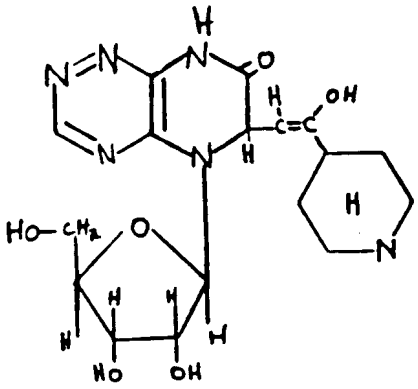
SEE OR SEARCH CLASS:

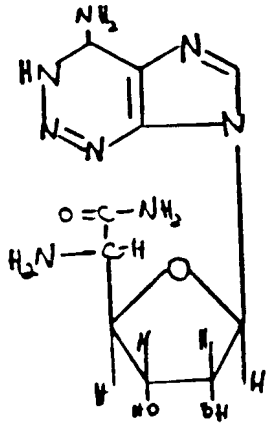
435, Chemistry: Molecular Biology and Microbiology, appropriate subclasses for processes for the separation, isolation or purification of N-glycosides or nucleic acids which utilize a micro-organism or an enzyme.

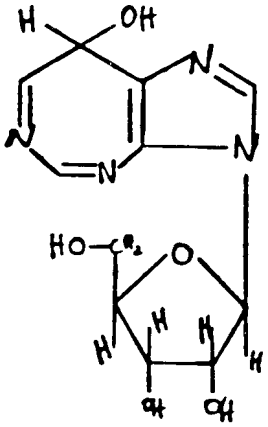
27.13 Bicyclic ring system consisting of the N-hetero ring fused to another hetero ring (e.g., 2-azaadenines, 6-azaadenines, etc.):

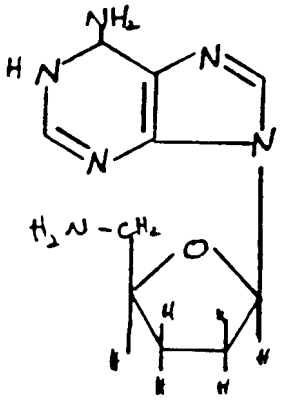
This subclass is indented under subclass 27.1. Compounds wherein the N-hetero ring is part of a bicyclic ring system which consists of an N-hetero ring fused to another hetero ring.

(1) Note. Examples of compounds provided for herein are:









27.2 The bicyclic ring system consists of a 1,3 diazine ring, which may be hydrogenated, fused to a five-membered N-hetero ring (e.g., purine isoesters like tubercidin, toyocamycin, sangivamycin, sparsomycin A, etc.):

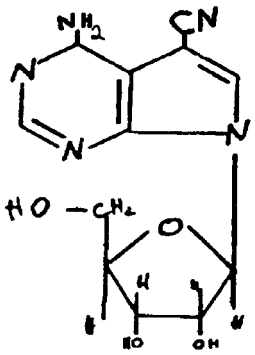
This subclass is indented under subclass 27.13. Compounds wherein a 1,3-diazine hetero ring, which may be hydrogenated, is fused to a five-membered N-hetero ring.

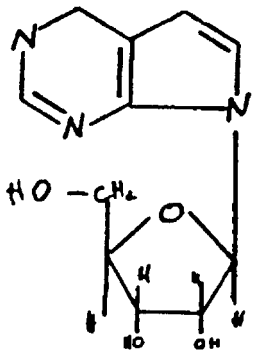
(1) Note. Examples of compounds provided for herein are:

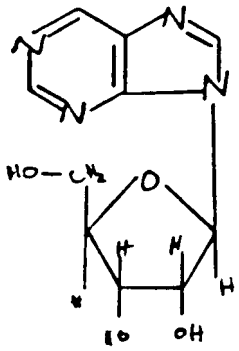
27.14 Multideoxy or didehydro:

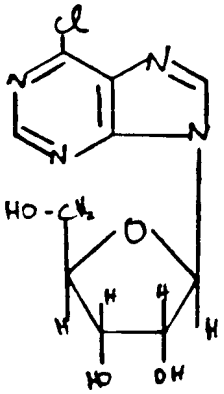
This subclass is indented under subclass 27.13. Compounds wherein two or more -OH groups, which would normally be attached to the sugar ring, have been replaced by hydrogen or another chemical group.

(1) Note. An example of a compound provided for herein is:









27.21 The five-membered N-hetero ring is 1,3-diazole, which may be hydrogenated (e.g., 6-chloropurine nucleoside, nebularin, etc.):

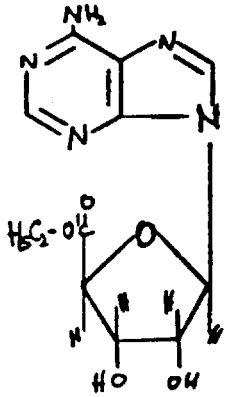
This subclass is indented under subclass 27.2. Compounds wherein the fused five-membered N-hetero ring is 1,3-diazole, which may be hydrogenated.

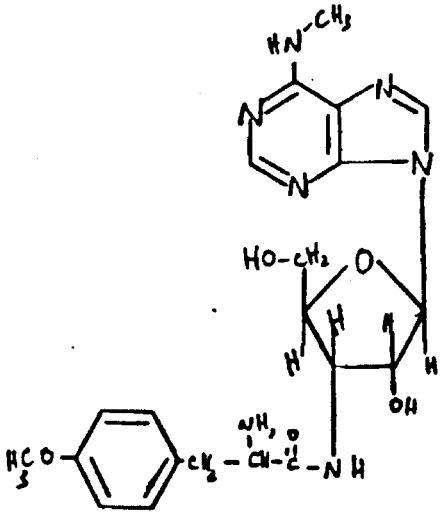
(1) Note. Examples of compounds provided for herein are (nebularin = top structure):

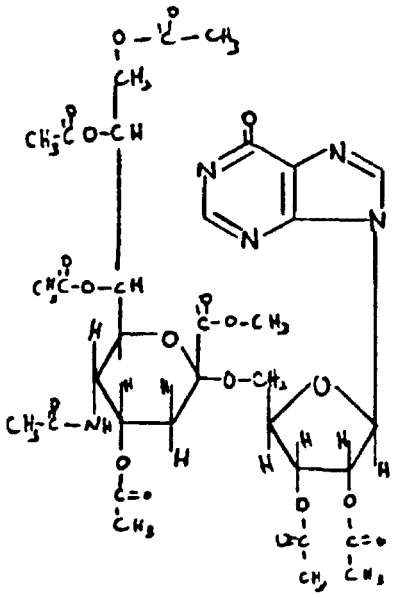
27.22 Carbonyl, thiocarbonyl, or nitrogen, other than as nitro or nitroso, bonded directly to the sugar ring:

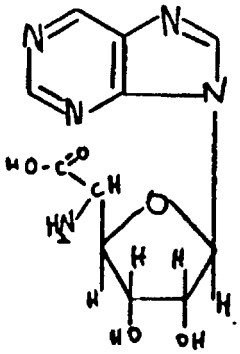
This subclass is indented under subclass 27.21. Compounds wherein the sugar ring of the nucleoside is bonded directly to carbonyl, thiocarbonyl, or nitrogen, other than as nitro or nitroso.

(1) Note. Examples of compounds provided for herein are:









27.23 Carbonyl, thiocarbonyl, additional hetero ring or nitrogen, other than as nitro or nitroso attached indirectly to the sugar ring by acyclic nonionic bonding:

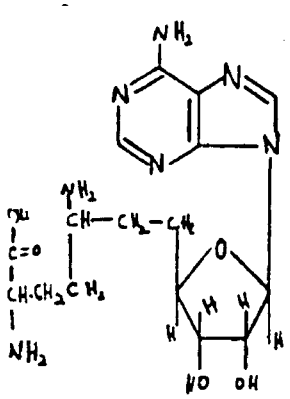
This subclass is indented under subclass 27.21. Compounds wherein thiocarbonyl, carbonyl, nitrogen, other than as nitro or nitroso, or an additional hetero ring is attached indirectly to the sugar ring of the nucleoside by acyclic nonionic bonding.

(1) Note. Examples of compounds provided for herein are:

27.3 Adenosyl:

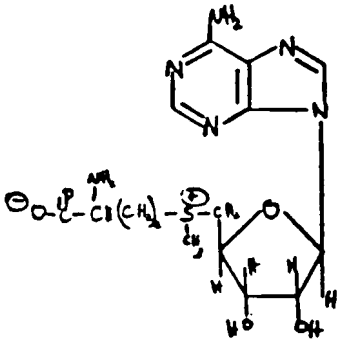
This subclass is indented under subclass 27.23. Compounds wherein the bicyclic ring system is adenine (6-aminopurine).

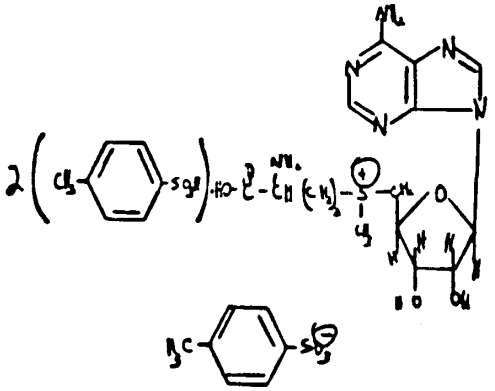
(1) Note. An example of a compound provided for herein is:



27.31 S-Adenosyl-L-methionine, S-Adenosyl-L-homocysteine, salts, or esters thereof:
This subclass is indented under subclass 27.3. A compound which is S-Adenosyl-L-methionine, S-Adenosyl-L-homocysteine, a salt thereof or an ester thereof.

(1) Note. Examples of compounds provided for herein are:



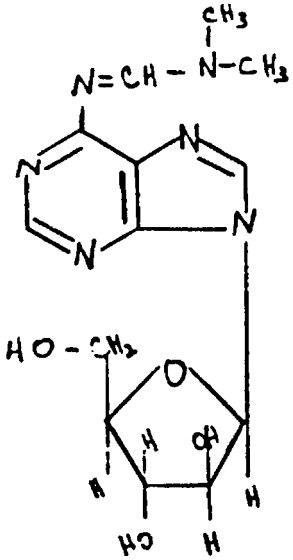


p-Toluene sulfonate of s-adenosyl-L-methionine

27.4 Arabinose is sugar moiety:
This subclass is indented under subclass 27.21. Compounds wherein the sugar ring is arabinose.

(1) Note. Arabinose is a pentose sugar. Arabinose and ribose are epimers (isomers) which differ in the configuration around carbon number 2.

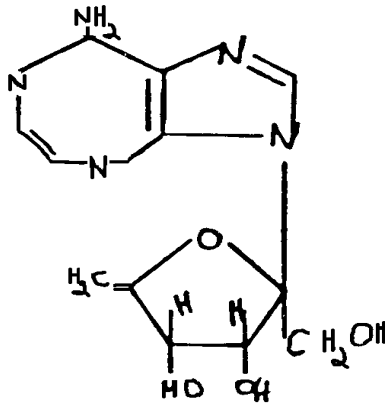
(2) Note. An example of a compound provided for herein is:



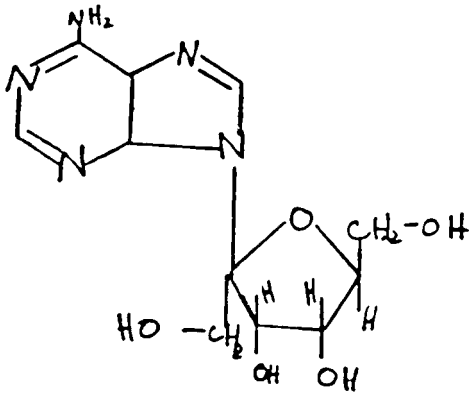
27.5 Ketose is sugar moiety (e.g., decoyinine, psicofuranosyl purines, etc.):
This subclass is indented under subclass 27.21. Compounds wherein the sugar moiety is a ketose.

(1) Note. A ketose is a sugar containing a ketone group when represented in straight chain form, and which forms a hemiketal in furanoside form.

(2) Note. Examples of compounds provided for herein are:



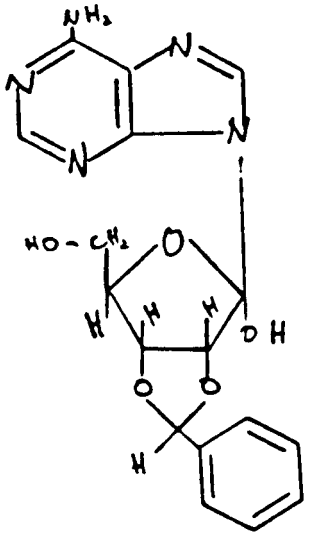
decoyinine



6-amino-9-psicofuranosylpurine

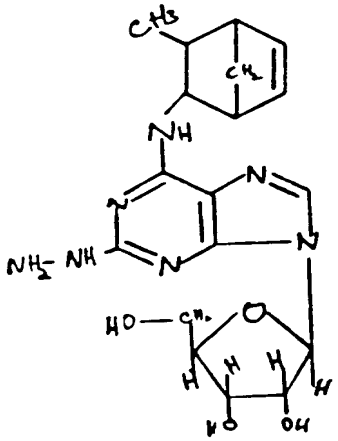
27.6 Nitrogen, other than nitro or nitroso, bonded directly to the 6-position of a purine ring system (e.g., adenosine, etc.):
This subclass is indented under subclass 27.21. Compounds wherein a nitrogen, other than as nitro or nitroso, is bonded directly to the 6-position of a purine ring system.

(1) Note. An example of a compound provided for herein is:



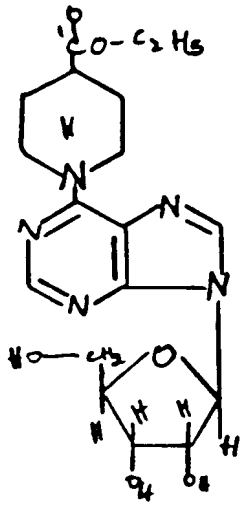
27.61 Additional nitrogen bonded directly to the 2-position of the purine ring system:
This subclass is indented under subclass 27.6. Compounds wherein the 2-position of the purine ring system has an additional nitrogen substituent bonded directly thereto.

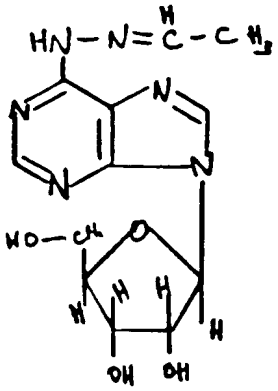
(1) Note. An example of a compound provided for herein is:



27.62 Nitrogen, chalcogen, or additional carbon bonded directly to the 6-position nitrogen (e.g., 6-position nitrogen is substituted, etc.):
This subclass is indented under subclass 27.6. Compounds wherein chalcogen (i.e., oxygen, sulfur, selenium, or tellurium), nitrogen, or additional carbon is bonded directly to the 6-position nitrogen.

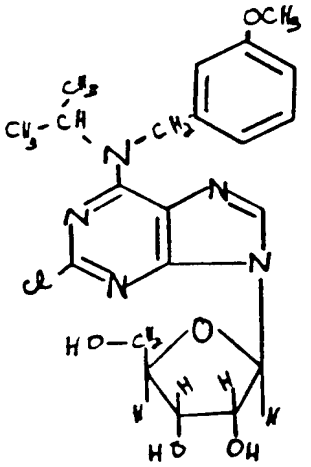
(1) Note. Examples of compounds provided for herein are:





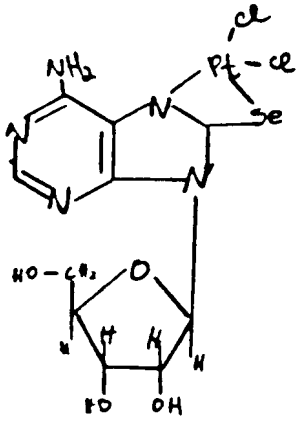
27.63 Halogen, chalcogen, or cyano bonded directly to the 2-position of the purine ring system:
This subclass is indented under subclass 27.62. Compounds wherein chalcogen (i.e., oxygen, sulfur, selenium, or tellurium), cyano, or halogen is bonded directly to the 2-position of the purine ring system.

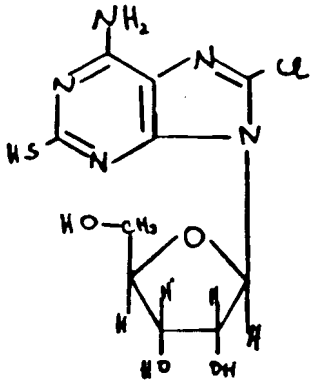
(1) Note. An example of a compound provided for herein is:



27.7 Chalcogen, halogen, or benzene bonded directly to carbon of the purine ring system (e.g., isoguanosine, 2-fluoroadenosine, etc.):
This subclass is indented under subclass 27.6. Compounds wherein benzene, chalcogen (i.e., oxygen, sulfur, selenium, or tellurium), or halogen is bonded to a carbon of the purine ring system.

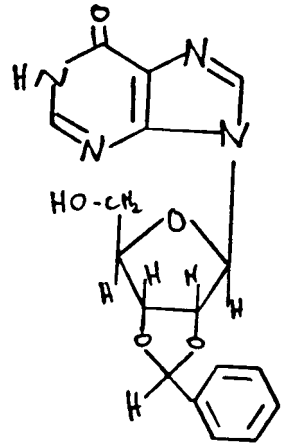
(1) Note. An example of a compound provided for herein is:





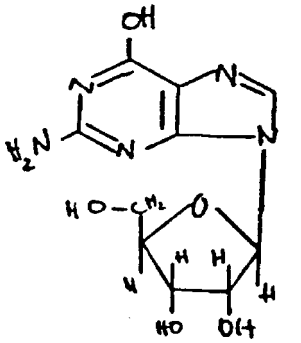
27.8 Chalcogen bonded directly to the 6- or 2-position of a purine ring system (e.g., inosine, etc.):
This subclass is indented under subclass 27.21. Compounds wherein chalcogen (i.e., oxygen, sulfur, selenium, or tellurium) is bonded directly to the 2-position or the 6-position of the purine ring system.

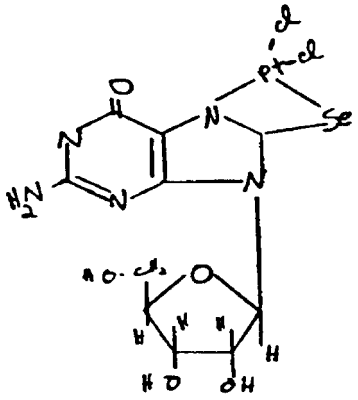
(1) Note. An example of a compound provided for herein is:



27.81 Nitrogen, other than nitro or nitroso, bonded directly to the 2-position of the purine ring system (e.g., guanosine, etc.):
This subclass is indented under subclass 27.8. Compounds wherein nitrogen, other than nitro or nitroso, is bonded directly to the 2-position carbon of the diazine ring in the purine ring system.

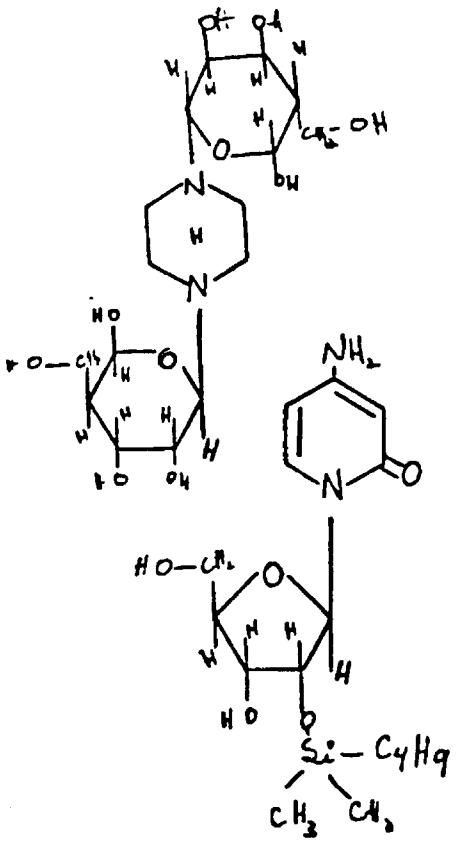
(1) Note. Examples of compounds provided for herein are:





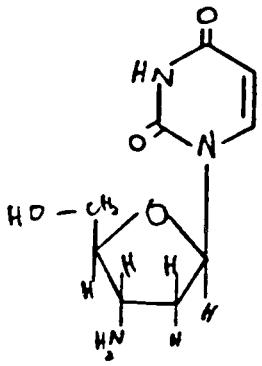
28.1 N-glycosides wherein the N is part of a six-membered hetero ring (e.g., diazines, etc.):
This subclass is indented under subclass 22.1. Compounds which are N-glycosides wherein the N of the N-glycoside moiety is part of a six-membered nitrogen containing hetero ring.

(1) Note. Examples of compounds provided for herein are:



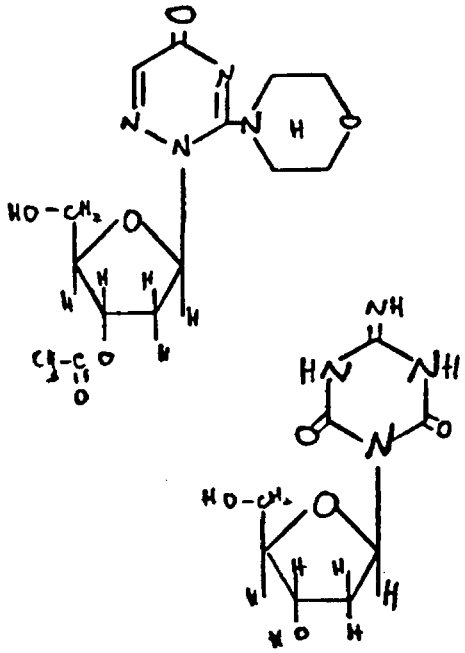
28.2 Multideoxy or didehydro:
This subclass is indented under subclass 28.1. Compounds wherein two or more -OH groups which would normally be attached to the sugar ring have been replaced by hydrogen or by another chemical group.

(1) Note. An example of a compound provided for herein is:



28.3 The N-hetero ring is a triazine ring, including hydrogenated (e.g., 6-azauridine, etc.):
This subclass is indented under subclass 28.1. Compounds wherein the N-hetero ring has exactly three nitrogens and three carbons.

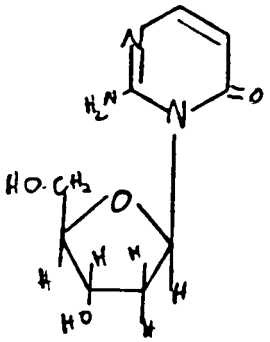
(1) Note. Examples of compounds provided for herein are:

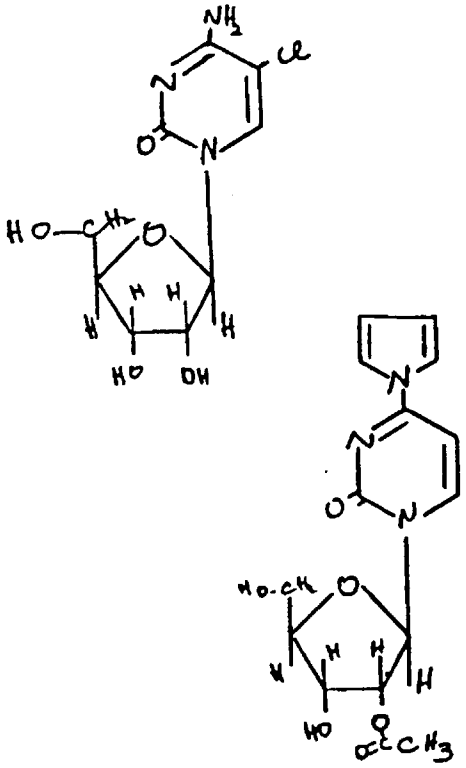


28.4 The N-hetero ring is a 1,3-diazine ring, including hydrogenated (e.g., pyrimidines, etc.):

This subclass is indented under subclass 28.1. Compounds wherein the N-hetero ring is a 1,3-diazine ring which may be hydrogenated.

(1) Note. An example of a compound provided for herein is:





28.5 Nitrogen, other than nitro or nitroso, bonded directly to the 4-position, and chalcogen bonded directly to the 2-position of the diazine ring (e.g., cytidines, etc.):

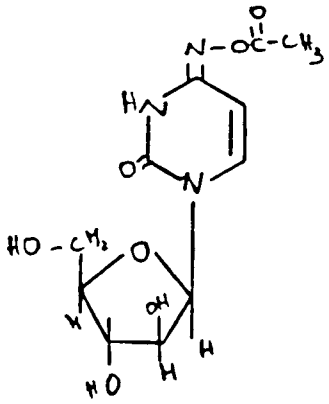
This subclass is indented under subclass 28.4. Compounds wherein nitrogen, other than nitro or nitroso, is bonded directly to the 4-position and chalcogen (i.e., oxygen, sulfur, selenium or tellurium) is bonded directly to the 2-position of the diazine ring.

(1) Note. Examples of compounds provided for herein are:

28.51 Having chalcogen, carbonyl, or thiocarbonyl bonded directly to the 4-position substituent nitrogen:

This subclass is indented under subclass 28.5. Compounds wherein carbonyl, thiocarbonyl, or chalcogen (i.e., oxygen, sulfur, selenium, or tellurium) is bonded directly to the 4-position substituent nitrogen.

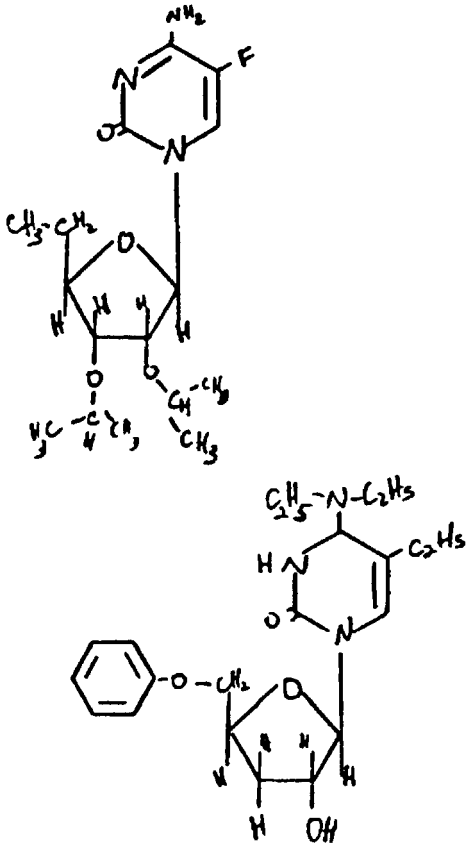
(1) Note. An example of a compound provided for herein is:



28.52 Halogen or alkyl group of 1-5 carbon atoms bonded directly to the 5-position of the diazine ring:

This subclass is indented under subclass 28.5. Compounds wherein an alkyl group of 1-5 carbon atoms or halogen is bonded directly to the 5-position carbon of the diazine ring.

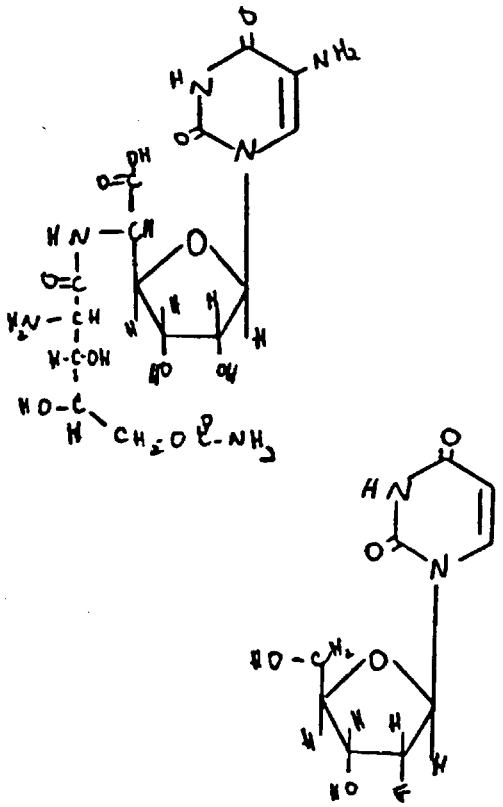
(1) Note. Examples of compounds provided for herein are:



28.53 Chalcogen bonded directly to the 2- and 4-positions of the diazine ring (e.g., uridine, etc.):

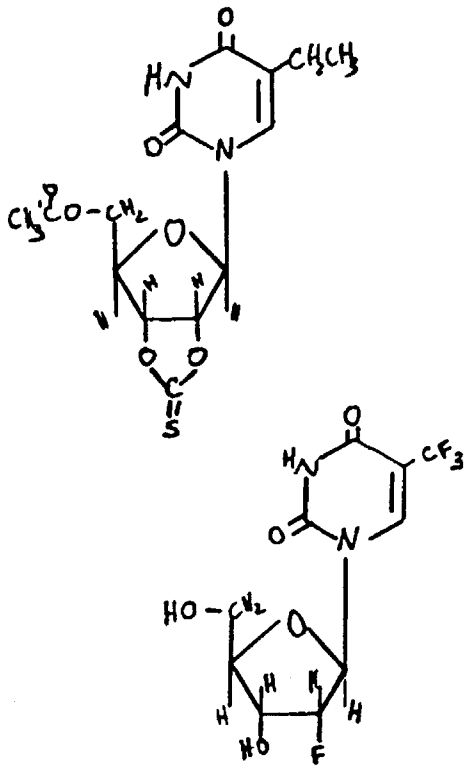
This subclass is indented under subclass 28.4. Compounds wherein chalcogen (i.e., oxygen, sulfur, selenium, or tellurium) is bonded directly to the 2- and 4-positions of the diazine ring.

(1) Note. Examples of compounds provided for herein are:



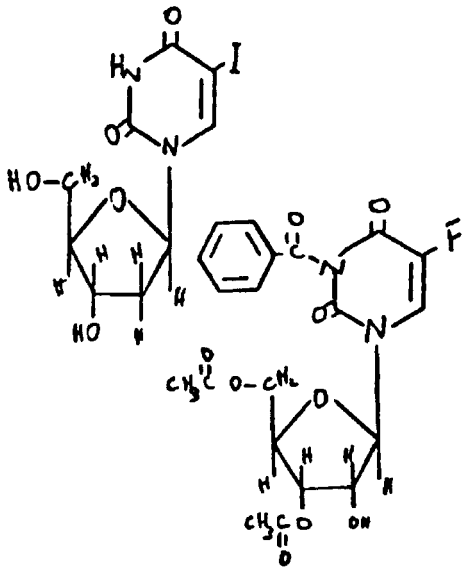
28.54 Alkyl, or substituted alkyl, bonded directly to the 5-position of the diazine ring (e.g., thymidine, 5-methyl uridine, etc.):
This subclass is indented under subclass 28.53. Compounds wherein an alkyl group, or a substituted alkyl group, is bonded directly to the 5-position of the diazine ring.

(1) Note. Examples of compounds provided for herein are:



28.55 Halogen bonded directly to the 5-position of the diazine ring (e.g., 5-fluorouridine, etc.):
This subclass is indented under subclass 28.53. Compounds wherein halogen is bonded directly to the 5-position of the diazine ring.

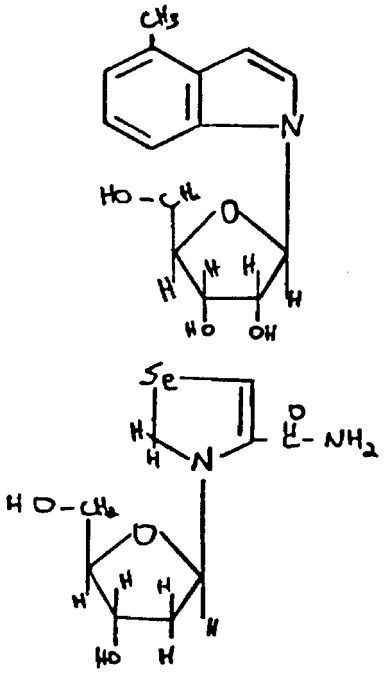
(1) Note. Examples of compounds provided for herein are:



28.6 N-glycosides wherein the N is part of a five-membered hetero ring (e.g., selenazole nucleosides, pyrrole nucleosides, etc.):

This subclass is indented under subclass 22.1. Compounds which are N-glycosides wherein the N of the N-glycoside moiety is part of a five-membered nitrogen containing hetero ring.

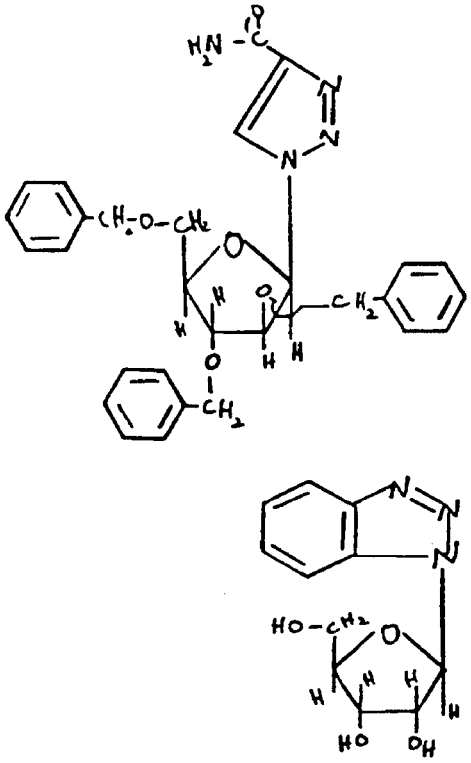
(1) Note. Examples of compounds provided for herein are:



28.7 Plural nitrogens in the N-hetero ring (e.g., triazoles, etc.):

This subclass is indented under subclass 28.6. Compounds wherein the N-hetero ring contains plural nitrogens.

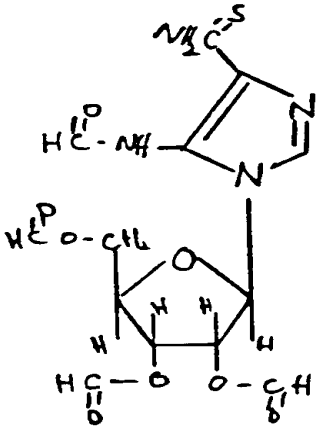
(1) Note. Examples of compounds provided for herein are:



28.8 The N-hetero ring is a 1,3-diazole ring, including hydrogenated (e.g., imidazoles, etc.):

This subclass is indented under subclass 28.7. Compounds wherein the N-hetero ring is a 1,3-diazole ring which may be hydrogenated.

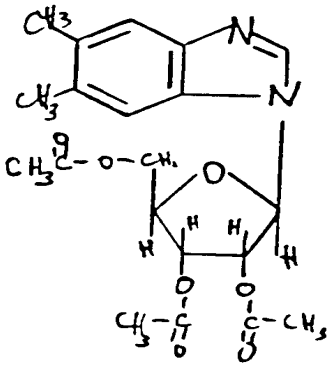
(1) Note. An example of a compound provided for herein is:



28.9 Benzimidazoles:

This subclass is indented under subclass 28.8. Compounds wherein the N-hetero ring is part of a benzimidazole ring system.

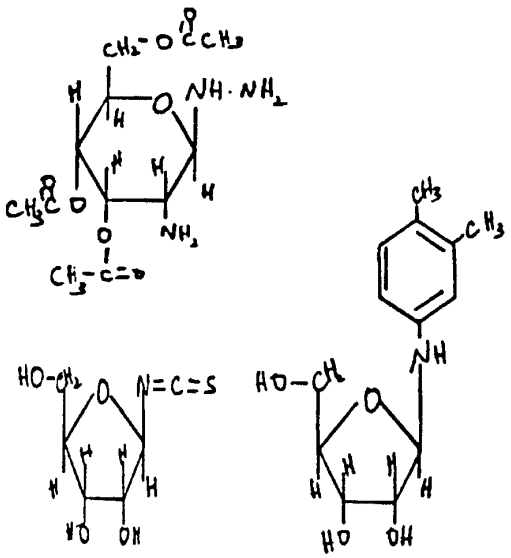
(1) Note. An example of a compound provided for herein is:



29.1 Nitrogen of N-glycoside is acyclic nitrogen:

This subclass is indented under subclass 22.1. Compounds wherein the nitrogen of the N-glycoside is acyclic nitrogen (is not part of cyclic structure).

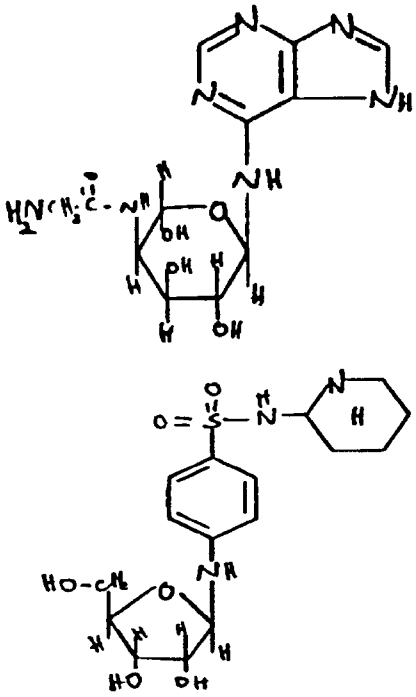
(1) Note. Examples of compounds provided for herein are:



29.11 N-hetero ring bonded directly or indirectly to the acyclic nitrogen:

This subclass is indented under subclass 29.1. Compounds wherein a nitrogen containing hetero ring is bonded directly or indirectly to the acyclic nitrogen of the N-glycoside.

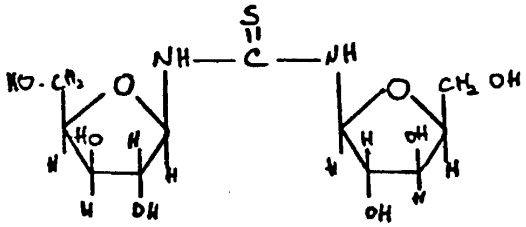
(1) Note. Examples of compounds provided for herein are:

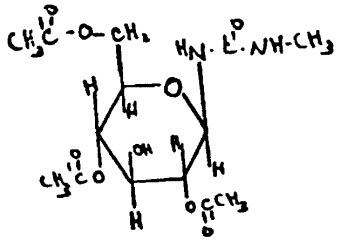


29.12 The acyclic nitrogen is part of a urea or thiourea group:

This subclass is indented under subclass 29.1. Compounds wherein the acyclic nitrogen of the N-glycoside is part of a urea or a thiourea group.

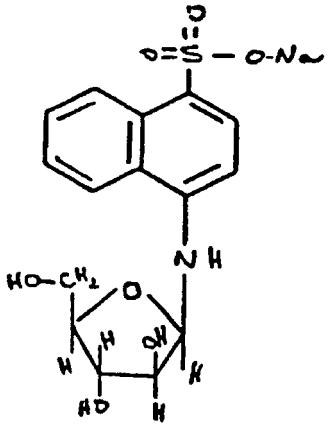
(1) Note. Examples of compounds provided for herein are:





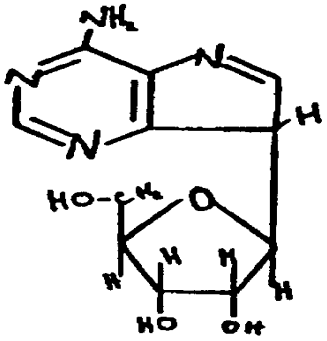
29.13 Sulfur containing (e.g., sulfides, sulfones, sulfates, sulfonamides, etc.):
This subclass is indented under subclass 29.1. Compounds which contain sulfur.

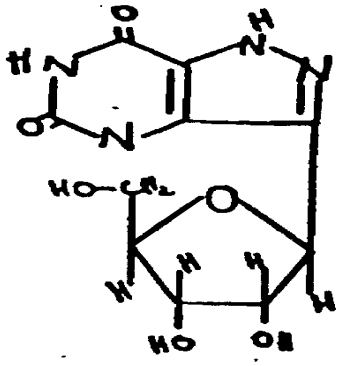
(1) Note. An example of a compound provided for herein is:



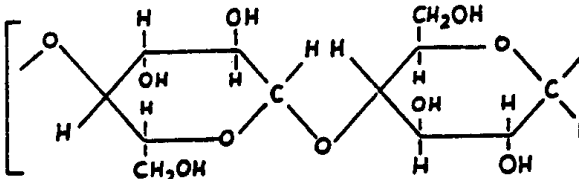
29.2 C-glycosides wherein the sugar ring is bonded directly to carbon of an N-hetero ring (e.g., 9-deazaadenosines, etc.):
This subclass is indented under subclass 18.7. Compounds which are glycosidic derivatives of the cyclic forms of sugars in which the aglycone portion includes an N-hetero ring, which hetero ring is attached through ring carbon to the sugar moiety by substituting it for the hemiacetal hydroxyl of the sugar.

(1) Note. Examples of compounds provided for herein are:





30 This subclass is indented under subclass 18.7. Compounds which are nitrogen containing derivatives of repeating glucose units, which units have the following structure:



Cellulose

31 This subclass is indented under subclass 30. Compounds which include a heterocyclic ring having nitrogen as a ring member.

32 This subclass is indented under subclass 30. Compounds which result from the reaction of a hydroxyl group of cellulose with an acid.

(1) Note. The esterifying acid may include nitrogen and may be organic or inorganic.

(2) Note. This subclass does not provide for compounds formed when the sole acid entering into the formation is a halogen.

33 This subclass is indented under subclass 32. Compounds in which the acid moiety contains sulfur.

34 This subclass is indented under subclass 32. Compounds in which the acid moiety contains phosphorus.

35 This subclass is indented under subclass 32. Compounds in which the acid is nitric acid, and the resulting compound contains the $-NO_3$ radical.

36 This subclass is indented under subclass 35. Compounds which contain, in addition to the $-NO_3$ radical, adiverse esterifying acid radical.

37 This subclass is indented under subclass 35. Processes in which cellulose undergoes a physical or chemical treatment prior to the nitration step.

38 This subclass is indented under subclass 35. Processes in which cellulose nitrate is purified, recovered, separated, altered physically; or treated chemically wherein the primary intent is merely to modify a property of cellulose nitrate.

(1) Note. The processes herein may combine producing the nitrated cellulose with a subsequent treatment or may merely treat already formed cellulose nitrate.

39 This subclass is indented under subclass 38. Processes which include physically subdividing units of cellulose nitrate to form smaller particles.

(1) Note. The processes of this subclass include formation or treatment in addition to the comminuting.

SEE OR SEARCH CLASS:
241, Solid Material Comminution or Disintegration, for comminuting, per se.

40 This subclass is indented under subclass 38. Processes in which nitrated cellulose is recovered from photos:graphic film.

41 This subclass is indented under subclass 38. Processes wherein the flow resistance or amount of polymerization of nitrated cellulose is altered.

42 This subclass is indented under subclass 38. Processes for increasing the physical or chemical stability of cellulose nitrate.

43 This subclass is indented under subclass 30. Compounds which have the general formula ROR', wherein RO is the cellulose residue moiety and R' is an organic radical.

(1) Note. Nitrogen containing cellulose ethers are made by substituting and organic radical for the hydrogen atom of a portion of the hydroxyl groups of cellulose.

(2) Note. The attached organic radical R' is referred to as the etherifying radical.

44 This subclass is indented under subclass 43. Compounds which contain at least two diverse organic radicals attached via ether linkages to the cellulose residue moiety.

45 This subclass is indented under subclass 18.7. Compounds which have amylose and amylopectin as their two main components.

(1) Note. Starches are heterogeneous in that the amylose and amylopectin occur in different rations to each other.

(2) Note. Starches yield dextrins upon extensive thermal or acid degradation and yield glucose upon complete hydrolysis.

46 This subclass is indented under subclass 45. Compounds which are any nitrogen containing derivatives of various gummy polysaccharides

produced by thermal or acid degradation of starch.

(1) Note. Dextrins are carbohydrates, intermediate between starch and sugars. Degradation of dextrins yields maltose and glucose.

(2) Note. For classification here the nitrogen containing derivatives of dextrin have to be gummy polysaccharides; sugars are not provided for herein.

47 This subclass is indented under subclass 45. Compounds which result from reacting starch with a reagent having at least two functional groups which link together starch molecules, usually via ether or ester linkages between hydroxyls of said molecule.

SEE OR SEARCH THIS CLASS, SUBCLASS:
48+, for nitrogen containing starch esters that are not cross-linked.
50, for nitrogen containing starch ethers that are not cross-linked.

48 This subclass is indented under subclass 45. Compounds which result from the reaction of a hydroxyl group of a nitrogen containing starch derivative with an acid.

(1) Note. The esterifying acid may be organic or inorganic.

(2) Note. This subclass does not provide for compounds formed when the sole acid moiety entering into the formation is a halogen.

SEE OR SEARCH THIS CLASS, SUBCLASS:
47, for nitrogen containing starch esters that are cross-linked.

49 This subclass is indented under subclass 48. Compounds which (1) additionally contain an ether moiety or (2) contain a plurality of diverse ester radicals.

(1) Note. The ether moiety may exist (1) independently of the ester moiety, as in nitrogen containing ethyl starch acetate, (2) by connection to the starch via an intervening ester linkage as in a nitrogen containing starch ethoxyacetate, or (3) by direct connection to the starch with the ester moiety connected to the ether moiety as in a a nitrogen containing acetoxyethyl starch.

50 This subclass is indented under subclass 45. Compounds which have the general formula ROR', wherein RO is the starch residue moiety and R' is an organic radical.

(1) Note. Nitrogen containing starch ethers can be made by substituting an organic radical for the hydrogen atom of a portion of the hydroxyl groups of a starch.

(2) Note. The attached organic radical R' is referred to as the etherifying radical.

SEE OR SEARCH THIS CLASS, SUBCLASS:
47, for nitrogen containing starch ethers that are cross-linked.

51 This subclass is indented under subclass 18.7. Compounds which are high molecular weight polysaccharides containing D-glucose units linked predominately -D (16).

(1) Note. Dextrans yield only glucose on hydrolysis but differ otherwise from starch and glycogen as in molecular structure, etc.

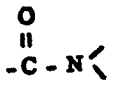
(2) Note. Dextrans are usually a group of compounds differing according to the bacteria used to ferment the sugar.

(3) Note. Controlled hydrolysis of native dextran yields clinical dextran of lower molecular weight which is useful as a blood plasma substitute.

52 This subclass is indented under subclass 18.7. Compounds which are exudations of plants produced to cover wounds and prevent attack by micro-organisms and are highly branched polysaccharides composed of two or more monosaccharides.

53 This subclass is indented under subclass 18.7. Compounds which contain a carbon atom to which nitrogen is directly bonded and to which oxygen is directly attached by a double bond.

(1) Note. This subclass provides for compounds having, for example, the group:

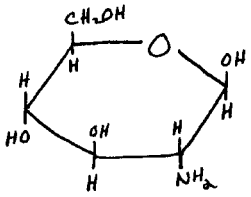


54 This subclass is indented under subclass 18.7. Compounds which contain sulfur in addition to nitrogen.

55 This subclass is indented under subclass 18.7. Compounds which contain two or more atoms of nitrogen.

55.1 Polysaccharides:
This subclass is indented under subclass 55. Products wherein the nitrogen containing carbohydrate consists of two or more sugar moieties.

55.2 Glucosamine containing:
This subclass is indented under subclass 18.7. Compounds which include an amine of glucose of the formula (below) and derivatives thereof.



55.3 Processes:
This subclass is indented under subclass 18.7. Processes which are directed to the preparation, purification, recovery, stabilization or treatment in any way of nitrogen containing derivatives of carbohydrates.

56 This subclass is indented under subclass 1.1. Compounds which consist of repeating glucose units having the following structure:

SEE OR SEARCH THIS CLASS, SUBCLASS:
30, for nitrogen containing cellulose derivatives.

57 This subclass is indented under subclass 56. Compounds which are formed by changing a cellulose derivative back to cellulose.

SEE OR SEARCH THIS CLASS, SUBCLASS:
60+, for cellulose xanthate or viscose which is utilized to make regenerated cellulose.

58 This subclass is indented under subclass 56. Compounds which result from the reaction of a hydroxyl group of cellulose with an acid.

(1) Note. The esterifying acid may be organic or inorganic.

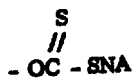
(2) Note. This subclass does not provide for compounds formed when the sole acid function entering into the formation is a halogen.

SEE OR SEARCH THIS CLASS, SUBCLASS:
32, for nitrogen containing cellulose esters.

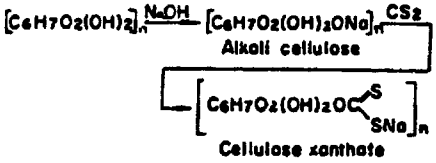
59 This subclass is indented under subclass 58. Compounds in which the acid moiety contains sulfur.

SEE OR SEARCH THIS CLASS, SUBCLASS:
33, for nitrogen containing cellulose esters in which the acid moiety contains sulfur.

60 This subclass is indented under subclass 59. Compounds which are cellulose derivatives that include the group:



(1) Note. The viscose process is based on the reaction of carbon disulfide with the sodium salt of cellulose to yield a xanthate, which forms a viscous colloidal solution in dilute aqueous alkali. This subclass provides for the colloidal solution as well as the cellulose xanthate.



SEE OR SEARCH THIS CLASS, SUBCLASS:
57, for regenerated cellulose.

61 This subclass is indented under subclass 60. Compounds in which cellulose xanthate or viscose is purified, recovered, separated, altered physically; or treated chemically wherein the primary intent is merely to modify a property of the product.

(1) Note. Merely forming viscose from the xanthate is not considered a subsequent treatment.

SEE OR SEARCH THIS CLASS, SUBCLASS:
57, for regenerated cellulose.

62 This subclass is indented under subclass 58. Compounds in which the acid moiety contains phosphorus.

SEE OR SEARCH THIS CLASS, SUBCLASS:
34, for nitrogen containing cellulose esters in which the acid moiety contains a phosphorus.

63 This subclass is indented under subclass 58. Compounds in which the acid moiety is a carboxylic acid.

64 This subclass is indented under subclass 63. Compounds which contain at least two diverse carboxylic acid moieties.

(1) Note. This subclass provides for stearyl cellulose acetate, for example.

65 This subclass is indented under subclass 64. Compounds in which at least one of the carboxylic acid moieties is a propionate, butyrate or isobutyrate radical.

66 This subclass is indented under subclass 63. Compounds which additionally contain an ether moiety.

(1) Note. The ether moiety may exist (1) independently of the ester moiety as in ethyl cellulose acetate, (2) by connection to the cellulose via an intervening ester linkage, as in cellulose ethoxy acetate, or (3) by direct connection to the cellulose with the ester radical connected to the ether radical as in acetoxyethyl cellulose.

67 This subclass is indented under subclass 63. Compounds in which the carboxylic acid moiety is the formate radical.

68 This subclass is indented under subclass 63. Compounds in which the carboxylic acid moiety is either the propionate, butyrate or isobutyrate radical.

69 This subclass is indented under subclass 63. Compounds in which the carboxylic acid moiety is the acetate radical.

70 This subclass is indented under subclass 69. Processes in which cellulose undergoes a physical or chemical treatment prior to the formation of the acetate ester.

71 This subclass is indented under subclass 70. Processes in which acetic acid is used in the pretreatment.

(1) Note. In these processes acetic acid is employed in the pretreatment in addition to the acetic acid or acetic anhydride used to form the acetate.

72 This subclass is indented under subclass 71. Processes in which a halogen containing compound is employed in the pretreatment of the cellulose or in the formation of the cellulose acetate.

73 This subclass is indented under subclass 71. Processes wherein a sulfur containing compound is also used in the pretreatment.

74 This subclass is indented under subclass 70. Processes in which a sulfur containing compound is used in the pretreatment.

75 This subclass is indented under subclass 70. Processes in which a compound containing a halogen is employed in the pretreatment of the cellulose or in the formation of the cellulose acetate.

76 This subclass is indented under subclass 69. Processes in which cellulose acetates are purified, recovered, separated, altered physically; or treated chemically wherein the primary intent is merely to modify a property of the cellulose acetate.

77 This subclass is indented under subclass 76. Processes which include physically subdividing units of the compound to form smaller particles or subjecting the compound to centrifugal force.

SEE OR SEARCH CLASS:
241, Solid Material Comminution or Disintegration, for comminuting, per se.

78 This subclass is indented under subclass 76. Processes in which cellulose acetate is recovered from photos:graphic film.

79 This subclass is indented under subclass 76. Processes which result in the inhibition or reduction of the corrosive properties of cellulose acetates.

80 This subclass is indented under subclass 76. Processes wherein the flow resistance or amount of polymerization is altered.

81 This subclass is indented under subclass 76. Processes whereby the physical or chemical stability of cellulose acetate is increased.

82 This subclass is indented under subclass 76. Processes in which a halogen containing compound is utilized in the subsequent treatment or in the formation of cellulose acetate.

83 This subclass is indented under subclass 69. Processes in which a halogen containing compound is utilized in the formation of cellulose acetate.

SEE OR SEARCH THIS CLASS, SUBCLASS:
72, and 75, for a process of making cellulose acetate which includes a pretreatment wherein a halogen containing compound is utilized in pretreating the cellulose or in forming the cellulose acetate.
82, for a process which includes subsequent treatment of cellulose acetate and the use of a halogen containing compound in the subsequent treatment or in the formation of the cellulose acetate.

84 This subclass is indented under subclass 56. Compounds having the general formula ROR', wherein RO- is the cellulose residue moiety and R' is an organic radical.

(1) Note. Cellulose ethers are made by substituting an organic radical for the hydrogen atom of a portion of the hydroxyl groups of cellulose.

(2) Note. The attached organic radical R' is referred to as the etherifying radical.

SEE OR SEARCH THIS CLASS, SUBCLASS:
43, for nitrogen containing cellulose ethers.

85 This subclass is indented under subclass 84. Processes in which a cellulose ether is purified, recovered, separated, altered physically; or treated chemically wherein the primary intent is merely to modify a property of the cellulose ether.

(1) Note. The processes herein may combine producing the cellulose ether with a

subsequent treatment or may merely treat an already formed cellulose ether.

(2) Note. This subclass does not generally provide for processes wherein the intent is to make a derivative of the cellulose ether. However, cross-linking processes are included here as well as processes wherein the purpose is merely to modify a property of the cellulose ether, even when some derivatizing occurs.

SEE OR SEARCH THIS CLASS, SUBCLASS:
43, for subsequent treatment of nitrogen containing cellulose ether derivatives.

86 This subclass is indented under subclass 85. Processes which include physically subdividing units of the compound to form smaller particles.

(1) Note. This subclass provides for grinding, pulverizing, shearing, etc.

(2) Note. The processes of this subclass include formation or treatment in addition to the comminuting.

SEE OR SEARCH CLASS:
241, Solid Material Comminution or Disintegration, for comminuting, per se.

87 This subclass is indented under subclass 85. Processes which include altering the interworking characteristics of the compound with liquids.

88 This subclass is indented under subclass 85. Processes wherein the flow resistance, amount of polymerization, or high temperature stability is altered.

89 This subclass is indented under subclass 85. Processes wherein an organic acid or an inorganic acid is employed in the subsequent treatment.

90 This subclass is indented under subclass 84. Compounds which contain at least two diverse organic radicals attached via ether linkages to the cellulose residue moiety.

(1) Note. This subclass provides for methyl benzyl cellulose, for example.

SEE OR SEARCH THIS CLASS, SUBCLASS:
44, for nitrogen containing mixed ethers of cellulose.

91 This subclass is indented under subclass 90. Compounds wherein at least one of the radicals attached via the ether linkage is a hydroxyalkyl radical.

92 This subclass is indented under subclass 84. Compounds wherein the etherifying radical contains sulfur.

93 This subclass is indented under subclass 84. Compounds wherein the etherifying radical contains a double or triple bond.

94 This subclass is indented under subclass 93. Compounds wherein an etherifying radical contains a benzene ring.

95 This subclass is indented under subclass 84. Compounds wherein the etherifying radical is a hydoxyalkyl radical.

96 This subclass is indented under subclass 95. Compounds wherein the hydroxyalkyl is hydroxyethyl.

97 This subclass is indented under subclass 84. Compounds wherein the etherifying radical is the carboxyalkyl radical or a salt thereof.

98 This subclass is indented under subclass 97. Compounds wherein the etherifying radical is the carboxymethyl radical or a salt thereof.

99 This subclass is indented under subclass 84. Compounds wherein the etherifying radical is an alkyl or cycloalkyl radical.

100 This subclass is indented under subclass 99. Compounds wherein the ehterifying radical is the ethyl radical.

101 This subclass is indented under subclass 56. Compounds which include metal.

102 This subclass is indented under subclass 1.1. Compounds which have amylose and amylopectin as their two main components, and derivatives of such compounds.

(1) Note. Starches are heterogeneous in that the amylose and amylopectin occur in different ratios to each other.

(2) Note. Starches yield dextrins upon extensive degradation and yield glucose upon complete hydrolysis.

SEE OR SEARCH THIS CLASS, SUBCLASS:
45, for nitrogen containing derivatives of starch.

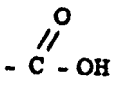
103 This subclass is indented under subclass 102. Compounds which are any of various gummy polysaccharides produced by thermal or acid degradation of starch, and derivatives of such compounds.

(1) Note. Dextrins are carbohydrates, intermediate between starch and sugars. Degradation of dextrins yields maltose and glucose.

(2) Note. Derivatives of dextrins which remain gummy polysaccharides are classified herein; however, sugars are not provided for here.

SEE OR SEARCH THIS CLASS, SUBCLASS:
46, for nitrogen containing dextrin derivatives.

104 This subclass is indented under subclass 102. Compounds which result from a chemical reaction between starch, or a derivative thereof, and a reactant containing the functional group and derivatives of such compounds.



105 This subclass is indented under subclass 102. Compounds which result from reacting starch or a derivative thereof, with an oxidizing reagent, and derivatives of such compounds.

106 This subclass is indented under subclass 102. Compounds which result from reacting starch with a reagent having at least two functional groups which link together starch molecules, usually via ether or ester linkage between hydroxyls of said molecules.

SEE OR SEARCH THIS CLASS, SUBCLASS:
47, for nitrogen containing cross-linked starch derivativess.
107, for starch esters that are not cross-linked.
111, forstarch ethers that are not cross-linked.

107 This subclass is indented under subclass 102. Compounds which result from the reaction of a hydroxyl group of a starch with an acid.

(1) Note. The esterifying acid may be organic or inorganic.

(2) Note. This subclass does not provide for compounds formed when the sole acid function entering into the formation is a halogen.

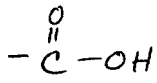
SEE OR SEARCH THIS CLASS, SUBCLASS:
47, for nitrogen containing starch molecules connected via ester linkage.
48, for nitrogen containing starch esters.
106, for starch esters that are cross-linked.

108 This subclass is indented under subclass 107. Compounds which (1) additionally contain an ether moiety, or (2) contain at least two diverse ester moieties.

(1) Note. The ether moiety may exist (1) independently of the ester moiety as in ehtyl starch acetate, (2) connection to the starch via an intervening ester linkage as in starch ethoxyacetate, or (3) by direct connection to the starch with the ester moiety connected to the ether moiety as in acetoxyethyl starch.

109 This subclass is indented under subclass 107. Compounds which include phosphorus or sulfer.

110 This subclass is indented under subclass 107. Compounds wherein the acid reactant contains a carboxylic acid group



111 This subclass is indented under subclass 102. Compounds having the general formula ROR', wherein RO- is the starch residue moiety and R' is an organic radical.

(1) Note. Starch ethers are made by substituting an organic radical for the hydrogen atom of a portion of the hydroxyl groups of starch.

(2) Note. The attached organic radical R' is referred to as the etherifying radical.

SEE OR SEARCH THIS CLASS, SUBCLASS:

47, for nitrogen containing starch molecules connected via ether linkage.
50, for nitrogen containing starch ethers.
106, for starch ethers that are cross-linked.

112 This subclass is indented under subclass 1.1. Compounds which are high molecular weight polysaccharides containingD-glucose units linked predominately -D (16).

(1) Note. Dextrans yield only glucose on hydrolysis but differ otherwise from starch and glycogen as in molecular structure, etc.

(2) Note. Dextrans are actually a group of compounds differing according to the bacteria used to ferment the sugar.

(3) Note. Controlled hydrolysis of native detran yields clinical dextran of lower molecular weight which is useful as a blood plasma substitute.

SEE OR SEARCH THIS CLASS, SUBCLASS:

51, for nitrogen containing dextran derivatives.

113 This subclass is indented under subclass 112. Compounds which include iron.

114 This subclass is indented under subclass 1.1. Compounds which are exudations of plants produced to cover wounds and prevent attack by micro-organisms and are highly branched polysaccharides composed of two or more monosaccharides.

SEE OR SEARCH THIS CLASS, SUBCLASS:

52, for nitrogen containing gums.

115 This subclass is indented under subclass 1. Compounds which result from the reaction of a hydroxyl group of a carbohydrate with an acid.

(1) Note. The esterifying acid may be organic or inoraganic.

(2) Note. This subclass does not provide for compounds formed when the sole acid function entering into the formation is a halogen.

116 This subclass is indented under subclass 115. Compounds which additionally contain an ether moiety.

(1) Note. Carbohydrate ethers are explained in the definition and notes for subclass 120.

(2) Note. The ether moiety may exist (1) independently of the ester moiety as in ethyl sucrose acetate, (2) by connection to the carbohydrate via an intervening ester linkage as in sucrose ethoxyacetate, or (3) by direct connection to the carbohydrate with the ester moiety connected to the ether moiety as in acetoxyethyl sucrose.

117 This subclass is indented under subclass 115. Compounds which include phosphorus.

118 This subclass is indented under subclass 115. Compounds which include sulfur.

119 This subclass is indented under subclass 115. Compounds wherein the esterifying acid is carboxylic acid.

120 This subclass is indented under subclass 1.1. Compounds having the general formula ROR', wherein RO- is the carbohydrate residue moiety and R' is an organic radical.

(1) Note. Carbohydrate ethers can be made by subsituting an organic radical for the hydrogen atom of a portion of the hydroxyl groups of a carbohydrate.

(2) Note. The organic radical R' may also be a carbohydrate moiety.

121 This subclass is indented under subclass 1.1. Compounds which include metal.

(1) Note. For the purpose of this subclass arsenic is considered to be a metal while silicon, selenium, and tellurium are not metals.

122 This subclass is indented under subclass 1.1. Compounds which include sulfur, fluorine, chlorine, bromine, iodine or astatine.

123 Plural diverse saccharides containing (e.g., heteropolysaccarides, etc.):
This subclass is indented under subclass 1.1. Products which contain three or more sugar moieties, at least two of which are different.

(1) Note. Included in this subclass are products referred to as conplex polysaccharides.

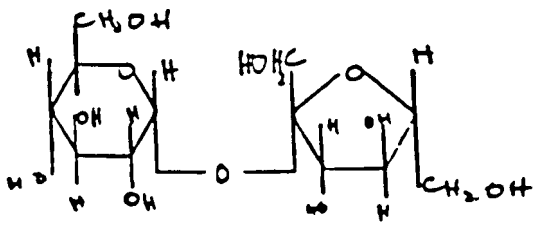
123.1 Polysaccharides:
This subclass is indented under subclass 1.11. Compounds which are polymers containing a sugar ring as the monomeric unit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
114, for polysaccharides that are gums (e.g., plant exudates, etc.).
123, for heteropolysaccharides and complex saccharides.

123.12 Glucans (e.g., pullulan, etc.):
This subclass is indented under subclass 123.1. Compounds which are polymers of D-glucopyranose.

123.13 Disaccharides (e.g., maltose, sucrose, lactose, formaldehyde lactose, etc.):
This subclass is indented under subclass 123.1. Compounds which contain exactly two monosaccharides units covalently bonded to each other.

(1) Note. An example of a compound provided for herein is sucrose:



124 Processes:
This subclass is indented under subclass 1.1. Processes which are directed to the preparation, purification, recovery, stabilization, or treatment in any way of carbohydrates or derivatives of carbohydrates.

125 Isomerization:
This subclass is indented under subclass 124. Processes wherein a carbohydrate is prepared by transformation or rearrangement of the elements of a starting compound without adding or taking away any element.

126 Polymerization:
This subclass is indented under subclass 124. Processes wherein a carbohydrate is prepared by a reaction wherein two or more molecules of the same sugar combine.

127 Purification or recovery:
This subclass is indented under subclass 124. Process which include separating a carbohydrate from impurities or from the reaction mixture.

128 From plant material:

This subclass is indented under subclass 127. Processes wherein a carbohydrate is separated or recovered from plant material.

END